AMERICAN GAS ASSOCIATION MONTHLY

DECEMBER · 1937

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AMERICAN GAS
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MONTHLY

James M. Beall, Editor

The Home Planning Program

AFTER months of careful consideration, the gas industry is ready to launch a nationwide program for the equipment of new homes and the modernization of old ones by the installation of modern gas appliances. The program, as announced November 21 by the Home Appliance Planning Bureau, consists of a national architectural contest for the design of all-gas homes and a builders' competition for the construction of all-gas homes. It also contemplates, following these contests, the erection of several of the prize-winning all-gas houses, fully equipped and furnished, at the 1939 New York World's Fair.

In the belief that a revival of home building activity, which is necessary to business prosperity, will result in the construction of several million new homes over the next few years, this program has been undertaken to keep gas in the forefront of the public consciousness and to assure that the builders and architects as well as the public are fully informed concerning modern gas equipment.

As the first step in this program the architectural contest for the design of all-gas homes will be announced to the architectural profession in March. Prizes totaling $13,700 will be offered. Every active architect in the United States and Canada will be provided with the necessary data on gas equipment without which no architect can compete. This will be accomplished by publication of a special gas equipment and information section of *The Architectural Forum*, which has been selected to announce the contest. This section, which will be reprinted and widely distributed, will contain full information on the latest gas equipment available.

Whether an architect enters the contest or not, he will receive information concerning gas equipment for daily reference and guidance in selecting the equipment for houses he designs.

Coincident with the announcement of the architects' competition, there will be announced a contest for builders who actually erect all-gas homes. This contest will be open for a year and those builders who erect the best gas-equipped homes will participate in $10,000 in prize money. Prize-winning builders will be required under the rules of this contest to keep their homes open for public inspection for a period of thirty days following the awards. In this way, millions of people may see modern gas appliances in actual operation.

The far-reaching effects of this program, adequately supported by advertising and publicity, can readily be seen. No one in any way connected with the gas industry will question the necessity for such a program or the fact that it will substantially increase the sale of gas burning equipment. It needs, however, the full cooperation of the local gas companies and the gas appliance manufacturers to meet with complete success. The manufacturers, through the Association of Gas Appliance and Equipment Manufacturers have pledged their whole-hearted support. So have the leaders of the gas industry, many of whom were instrumental in bringing it to life. Here is a splendid opportunity for the gas industry to step out ahead of the field at the upturn of business activity.

A few of those present at a meeting in New York, November 21, to announce the new home planning program. Left to right: J. F. Quinlan, director, Home Appliance Planning Bureau; Merrill N. Davis, president, A. G. A. E. M.; Hall M. Henry, Utility Management Corp.; N. C. McGowen, president, American Gas Association; and Howard Myers, publisher, The Architectural Forum. Map in the background shows extent of the gas industry in the United States

Gas Appliance Needs of the Industry

By HENRY O. LOEBELL

Natural Gas Pipeline Co. of America, Chicago, Ill.

FROM 1929 to 1936 the domestic consumption of gas per customer, inclusive of house heating, has declined 10.7 per cent in the manufactured and mixed gas territory and 10 per cent in the territory supplied with natural gas.

Many reasons have been advanced for this decline, all of which can be grouped under three general headings:

1. The changing habits of the housewife;
2. The increased efficiency of new gas equipment;
3. Competition of other fuels.

We are not, however, so much concerned with the causes of this condition as we are with the cures. There is also no point in spending any time in explaining the vital importance of the domestic load to the industry. We must retain it if we are to enjoy a sound earnings position. The question is: How?

During this same period, between 1929 and 1936, the industry has attempted to promote the sale of domestic gas appliances, and in the last two or three years particularly your Association and the appliance manufacturers have sponsored many activities in the merchandising of ranges, water heaters, refrigerators, etc. National advertising has been added to support the local efforts and in general the industry has put forth greater endeavor to keep this load. Nevertheless, the downward trend is still dominant and as yet there is no indication that our present efforts are adequate to bring about a reversal.

There are only two conclusions that can be drawn from these facts: (1) Either we no longer have a market; or, (2) The merchandising efforts are inadequate to meet the situation.

It requires no statistical evidence to prove that the market still exists and that we have not fully developed its possibilities. The population has increased; the incomes of the people, while not reverting to the peaks of 1929, reflect large purchasing power; the habits of the people have changed somewhat, but there is no radical change in the modes of living; nor can we discover any tendency towards a lesser interest in comfort, cleanliness and convenience—all proven characteristics of the service we render.

If the market exists, what are we doing or failing to do that so far has made it impossible to get back on the right road?

In an attempt to solve this problem, the program committee has asked me to study and discuss it from the viewpoint of the appliance needs of the industry. In order to present an industry viewpoint and not personal opinion, the ideas of more than 150 executives of operating companies and appliance manufacturing companies were sought. It is gratifying to state that more than half of these men have expressed definite and candid opinions.

The conclusions which might be drawn from these confidential letters are numerous, but only the more important will be incorporated in my remarks.

First of all, I might say that there is practically a universal opinion among both the utility and the appliance men that the subject of appliance needs cannot be divorced from the subject of appliance merchandising. Both are tied hand in hand, and any discussion of appliances which ignores their merchandising would appear to be a waste of time. On this subject I shall have more to say. For the moment, I wish

Gas ranges undergoing tests at the A. G. A. Testing Laboratories in Cleveland, Ohio

Address before A. G. A. Convention, Cleveland, Ohio, September 30, 1937.

to discuss the various comments made on the shortcomings of the appliances now available and which reflect our needs.

Gas Range

I would say that the utility officials as a group appreciate the developments which have been made for them by the manufacturers of gas ranges. The restyling of the range, the introduction of color, the wider use of insulation, etc., have all received favorable comments.

On the other hand, there is a very definite opinion that the modern gas range does not meet competitive needs, both manufacturers and utility operators realizing that changes are essential to meet competition.

Specifically, it is felt that the heat created by the range in the kitchen must be eliminated, with perhaps the introduction of a heater for kitchen heating during the winter. It is believed that the range burners must be redesigned to give greater efficiency. To adapt itself to modern kitchens the range must be redesigned to permit it to stand flush against the wall.

We must take steps to speed up the preheating of ovens. We must improve our quality of enamel. We must eliminate the smell of gas when the burners are first lighted. An adequate broiler should be introduced into the range and, finally, we must develop a completely automatic range with controls which function within close limits. These are the features suggested to meet competition.

To go competition one better, innovations in the gas range are suggested such as a double vertical broiler of large input and an automatic deep well cooker for slow cooking and rapid deep fat frying—both desired improvements which could be exclusive features of the gas range.

Hugh Cuthrell's committee on the development of the certified performance range will consider these points and incorporate them in the design of their appliance.

On the other hand, this certified performance range is being designed for the upper income group of customers, whereas these very fundamental changes are needed in the range which is sold to the middle income customers, and numerous executives point to the need of a cheap range to incorporate most of these features which can be sold to the lower income groups.

Water Heater

Most of the utility executives have numerous favorable comments to make on the gas water heater. This is one load which has gained in many utilities. On the other hand, it is a load which is being lost by many other utilities as hot water is being incorporated in house heating equipment burning other fuels. Some suggest a combination house heating and water heating appliance to solve this problem. There is apparently a need for a low-priced, highly efficient water heater to enter the low income market bracket. Several of the executives feel that improvements in thermostats must be made and others would like to see more modern designs applied to the water heating equipment.

Refrigerator

As a group, the utilities are highly complimentary to the Electrolux organization for the contribution it has made to the industry with its product and its merchandising method. The specific needs pointed out, however, are expressed as being a low-priced unit for low income groups; also, a large unit for large homes and for commercial establishments. There is also a need for higher efficiency in a gas refrigerator because the improvements in the electric boxes have removed the economic advantage of the gas refrigerator in some localities where manufactured and mixed gas is served.

Air Conditioning

The utility representatives express appreciation for the efforts put forth by the manufacturers of summer air conditioning equipment. The opinion, however, is that the present equipment is involved and expensive and what the industry specifically needs is a unit of basic simplicity and reasonable efficiency at moderate cost.

General view of water heater test section of the A. G. A. Laboratories

House Heating

The house heating equipment on the market, considered from the standpoint of appearance and performance, is generally voted as satisfactory. Several distinct needs are emphasized, viz., a low-priced boiler for low income groups and greater efficiency in all types of central house heating equipment in order to increase the potential market and better meet competition from oil and coal stokers. With increased efficiency it is hoped that the problem of condensation and the expense of chimney linings can be eliminated.

A number of utility men expressed the need for auxiliary house heating devices for fall and spring use. A need has also been expressed for new methods of controlling heat input to a furnace more in direct proportion to the heat requirements as reflected by the outside temperature.

Miscellaneous

A number of utility executives expressed a need for table appliances and other miscellaneous equipment in order to meet competition and secure additional load. Such devices as toasters, cookers, clothes dryers, ironing machines, incinerators, etc., were mentioned. It was also suggested that consideration be given to the development of more attractive meters to be used in basements which the customers wish to convert into play rooms.

It is quite evident from the foregoing that our present appliances do not adequately meet the industry's needs.

The needs are positive, definite, specific. We know them. The manufacturers know them. Why, then, do we not have such equipment?

Obviously, I have thus far recited the needs of the industry as seen by the utility officials, whose major concern is the maintenance of load.

Let us now consider the views of the manufacturers, whose concern is the sale of appliances.

More than 60 per cent of the executives in the appliance group challenge the practical value of any new appliances at all. While conceding the possibilities and admitting their feasibility, these men stated in no uncertain terms that the need of the industry is not new or better appliances, but better merchandising of the available equipment, and, in many cases, a more careful consideration of adequate rate structures.

The appliance men are specific in stating that the utilities are primarily price sellers; that the dominant emphasis of utility sales departments is on low appliance cost with quality a minor consideration. "Under these conditions," they say, "what can we do? To meet the demands for low cost and sell to an organization keyed primarily to a price appeal we must sacrifice some place and, of course, quality suffers. The utilities get the very best equipment which can be made for the price they are willing to pay.

"We cannot get mass production because there are no uniform standards and many engineering standards are modified locally to meet purely local conditions and opinions."

These manufacturers view their research problem from two standpoints: (1) The innovations necessary to compete within the gas industry; and (2) The research necessary to compete with manufacturers of equipment using other fuels. Therefore, the justification for specific research for new gas equipment must be based upon their receiving a coordinated, unanimous viewpoint on what is needed and what this research should be, so that when the suggested developments are embodied in new equipment, and the equipment put on the market, it will receive the united acceptance and support of the industry.

There have been expressions of opinion that the utilities should supplement the research of the manufacturers with research of their own. If the utilities feel that the manufacturers are not making rapid enough progress, they can do this. The justification for such a move on the part of the utilities however must obviously be based upon the same premise that would guide the appliance manufacturers, viz.,—that there must be a concerted and unified demand for a certain piece of equipment—If such coordinated viewpoint does exist, the manufacturers stand ready and willing to undertake such development; therefore, parallel action of the utilities would be unnecessary.

These are not the statements of unqualified individuals. They are the agreed opinions of the men who sell you your equipment and they represent a fair cross-section of every type of appliance manufacturer. Apparently, our own house is not in perfect order. Apparently there is a definite cleavage of thought. On the one hand the utilities feel a need for improved, lower-priced equipment; on the other hand, the manufacturers feel that new equipment will help the situation very little.

(Continued on page 447)

This picture illustrates the tie-in made with Warner Brothers Strand Theatre, Brooklyn, N. Y., by The Brooklyn Union Gas Company in promoting "Borneo," a motion picture which features the gas refrigerator

The Executive's Responsibility for Accident Prevention

By JOHN STILWELL

Vice-President, Consolidated Edison Co. of New York

John Stilwell

"As the twig is bent, so grows the tree." There is no phrase in all literature, ancient or modern, more pertinent to the subject of this title: The Executive's Responsibility for Accident Prevention.

Success in practically all fields of endeavor must start at the bottom, but a successful accident prevention program, subject to the executive's approval and cooperation, must begin at the top.

It is not enough that an appropriation be granted to assure its success, for many a well-meaning executive has unstintingly sanctioned budgets far out of proportion to an organization's actual requirements, and only disheartening results have been attained.

Choosing a Director

In many organizations it has been, and I presume it still is, the practice to place in charge of the safety activities men, who by reason of reorganization, super-annuation, social prestige, or political preferment, are deprived of opportunity in their previously chosen fields. There may be found among this group that ideal person whose "light" has been hidden beneath that proverbial "bushel," but a true, sincere exponent of safety seldom, if ever, conceals for long that inborn interest in the subject. It just can't be done! He shines prominently among his fellow lesser-lights.

If such a man is on the corporation's payroll, it would be well and profitable to fit him into that niche as speedily as possible, but if he has had the job foisted upon him for the reasons stated above and no others, the accident prevention program is foredoomed to a tragic disappointment.

An appropriation no matter how generous is not an assurance of success under these circumstances, because while it is said: "Money Talks," it is also vitally necessary that some competent person be able to interpret that language in terms of profitable application.

Men, like children, are prone to mimic or imitate. An executive may, by an expression or an action, enlist the whole-hearted endorsement and support of every last man in the plant in the cause of accident prevention; or he may discourage and divorce every effort or hope entertained by those men for a consummation of this noble effort.

This is the third of a series of Safety Messages by prominent executives in the gas industry which is being sponsored by the Accident Prevention Committee. The first appeared in the July-August issue of the "Monthly" and the second, in two installments, in the September and October issues.

Men in all occupations desire healthful and safe working conditions and in modern industry that opportunity has long since been afforded. It is the duty of the executive to insist that these conditions prevail, not alone because it returns handsome dividends, but because of the satisfaction one has in preventing suffering and loss of limb through accidents which might be attributable to unsafe plant practices.

It is not a confession of weakness or a lack of discipline to say men should be *encouraged* to work safely, rather than to say that if they failed to do so dismissal would be the penalty, because many capable, loyal employees sometimes, even while exercising extreme caution, suffer injuries. To administer such severe discipline as a corrective measure for this failure is a short-sighted policy. It breaks down the morale, it reduces production and it fosters an attitude of fear and insecurity.

Having established a well-functioning safety organization, the head of which possesses that very rare, but essential combination of qualifications—a knowledge of men and machines—the disposition of such problems becomes his to enforce.

Personal Contact Effective

In big business as conducted today with its tens of thousands of employees, as compared with twenty-five years ago, when personnel was small and widely separated, the problem of personal contact becomes increasingly difficult. No effort should be spared however because of the size of the undertaking to maintain close contact with the employees by letter and notices but personal executive contact is far more effective.

A letter from an executive complimenting an individual, a group or a company on a successful accident experience, or one deploring the non-achievement of such a record, has a salutary effect on the personnel. Life is replete with evidences of the witchery of praise, and no matter how self-centered or egotistical a man may be, he is susceptible to the influences of that commendation.

On the other hand, when an executive regards accident prevention solely from the standpoint of company interest or profit, a callous indifference to that project may be bred among those upon whose experience, that record good or bad, will be established.

It has always been the contention of our company that accident preven-

tion was mutually profitable, though it appears from a study of the early history of the movement that this belief was not universally shared. It was a radical departure from that accepted age-old theory that accidents were bound to happen, and many looked upon it with suspicion.

Today, however, I believe this attitude has changed. Machines and methods have undergone drastic transformations. Accident prevention has assumed a new importance. It is no longer considered as a sideline to be engaged in if, as, and when, an accident occurs or the opportunity offers. It is an integral, economically sound and humanely sensible function of modern industrial operation; just as essential as are the departments of purchase, stores, transportation, distribution, production, sales, personnel, public relations and good will.

Therefore, it is highly important that the safety personnel be carefully selected; that the safety educational programs be judiciously arranged and studiously applied; that the medical staff be of unquestioned ability; that architects and engineers plan and build safety into their struc-

(Continued on page 447)

New Petroleum Experiment Station Dedicated

New laboratory and office building

Gas analysis apparatus

THE new Petroleum Experiment Station at Bartlesville, Okla., operated by the United States Bureau of Mines in cooperation with the state of Oklahoma, was dedicated at an elaborate ceremony October 19 and 20. The program included addresses by Dr. John W. Finch, director of the Bureau of Mines, E. W. Marland, Governor of Oklahoma, a message from Harold L. Ickes, Secretary of the Interior, and talks by other outstanding speakers.

Dedication of the new experiment station marks an important extension in the work of the Bureau of Mines which has resulted in great benefits to the petroleum and natural gas industries. The Bartlesville station is the center of the Bureau's research activities on petroleum and natural gas and is one of the best-equipped public institutions devoted exclusively to the study of the problems confronting the petroleum and natural gas industries.

The station's work may be classified under the general heading of (1) problems of the production of petroleum and natural gas, including related problems of pipeline transportation; (2) engineering field studies of typical oil and gas fields; (3) chemistry and refining of petroleum; and (4) special technical studies, such as losses by evaporation, corrosion of oil and gas-field equipment, methods of "shutting-in" oil and gas wells to prevent damage during periods of inactivity, disposal of oil field brines, and the general subject of safety in oil fields and refineries.

Natural Gas Studies

Production, transportation, and conservation of natural gas form part of the station's technical studies.

A thorough study of leakage of gas from transmission lines resulted in the development of suitable means for measuring leakage from individual lines and for comparing the leakage from lines of different sizes, length, and types of construction. An intensive study of flow of gas through transmission lines under numerous conditions throughout the United States facilitated the selection of practicable formulas for computing the flow of gas through long high-pressure pipe lines. Additional work in connection with these studies has furnished valuable data pertaining to the chemical analyses, compressibility and viscosity of natural gases from many different fields.

Studies in cooperation with the National Bureau of Standards and the American Gas Association of the accuracy of orifice-meter measurements have made fundamental information on this subject available to the industry. A study of gaging and controlling natural gas wells has demonstrated a method of gaging the capacity of gas wells without waste and a method of estimating their productivity.

Other studies pertaining to estimation of reserves of natural gas have furnished data covering the reserves in many fields and have led to the use of more accurate methods in making estimates. Most of the natural gas studies of the station have been made with the cooperation of the American Gas Association.

N. A. C. Smith is supervising engineer of the Bartlesville station. W. B. Berwald is senior petroleum engineer and M. A. Schellhardt is natural gas engineer.

Calculation of Gas Consumption of Storage Water Heaters under Service Conditions

Paul L. Betz

By PAUL L. BETZ

Consolidated Gas, Electric Light and Power Company of Baltimore

THE purchaser of an automatic water heater often asks what it will cost him to operate the particular water heater he is considering. Obviously, it is important to be able to predetermine the operating costs of such an appliance. The answer to this question has, in the past, been the subject of some misunderstanding, as it was not clearly understood how the operating characteristics of the water heater and the service conditions could be combined to give the required answer. Therefore, the best that was done was to give an estimate, based on experience and on tests made under conditions which may or may not have approximated the particular conditions under which the purchaser would operate his water heater.

It is the purpose of this article to derive a method by which the monthly gas consumption of a water heater can be determined.[1] The method leads to a formula which makes use of the characteristics of the heater under consideration, and the conditions under which the heater is to operate.

I. Formula for Monthly Gas Consumption

A formula for the monthly gas consumption required to heat a given quantity of water each day and to maintain a tank full of water at elevated temperature may be derived as indicated below.

(1) B.t.u. input to burner for hot water used per day $= \frac{8.33\ G t_1}{e_{ut}}$

where G = daily hot water consumption, gals.

t_1 = temperature difference between outlet and inlet water.

e_{ut} = thermal efficiency at which water is heated (uncorrected for heat losses) expressed as a decimal.

(2) Daily operating period of burner to produce hot water

$$= \frac{(1)}{q} = \frac{8.33\ G t_1}{e_{ut} q} \text{ (hours)}$$

where q = manufacturer's input rating of burner, B.t.u. per hour.

(3) Daily standby period $= 24 - (2) = 24 - \frac{8.33\ G t_1}{e_{ut} q}$ (hours)

(4) Standby loss per hour $= h = 8.33\ V S t_2$ (B.t.u.)

where V = volume of tank, gals.

S = standby loss (expressed as a decimal and based on hourly heat loss from stored water above room temperature).

t_2 = temperature difference between stored water and room.

(5) B.t.u. input for standby period $=$

$$(3) \times (4) = \left(24 - \frac{8.33\ G t_1}{e_{ut} q}\right)\left(8.33\ V S t_2\right)$$

(6) Daily B.t.u. input to heater $=$ $(1) + (5) =$

$$\frac{8.33\ G t_1}{e_{ut}} + \left(24 - \frac{8.33\ G t_1}{e_{ut} q}\right)\left(8.33\ V S t_2\right)$$

$$= \frac{8.33\ G t_1}{e_{ut}} + \left(24 - \frac{8.33\ G t_1}{e_{ut} q}\right) h$$

$$= \frac{8.33\ G t_1}{e_{ut}} + \left(1 - \frac{h}{q}\right) + 24\ h$$

where $h = 8.33\ V S t_2$ (4)

(7) Monthly (30 day) gas consumption

$$= 30 \times \frac{(6)}{H}$$

$$= \frac{8.33 \times 30\ G t_1}{H\ e_{ut}}\left(1 - \frac{h}{q}\right) + \frac{24 \times 30\ h}{H}$$

$$= \frac{250\ G t_1}{H\ e_{ut}}\left(1 - \frac{h}{q}\right) + \frac{720\ h}{H}$$

where H = heat of combustion of gas, B.t.u. per cu.ft.

$h = 8.33\ V S t_2$ (4)

II. Comparison of Calculated and Actual Monthly Gas Consumptions

Having obtained a formula for monthly gas consumption, equation (7), the next step was to compare the results obtained with the formula with actual gas consumptions under different load conditions. Two water heaters of a well-known make were tested, one having a tank capacity of 20 gallons, and the other of 32 gallons. Tests were made on these heaters to determine the standby loss, and a thermal efficiency that differed from that obtained under the usual A. G. A. method, and is described more fully below. Draw-off tests were then carried out, and the actual gas consumption was determined together with the necessary data for use in the formula.

Two draw-off schedules were used, one for 50 gallons per day, and the other for 75 gallons per day. These schedules were in some respects more severe than is ordinarily used, as the entire daily draw-off was made in an eight-hour period. The schedules are given in Table I.

TABLE I. DRAW SCHEDULE

Time	*Daily Draw* 50 Gal.	75 Gal.
3 P.M.	4	6
4	10	15
5	2	3
5 P.M. to 9 A.M.	STANDBY	STANDBY
9 A.M.	10	15
10	3	4.5
11	7	10.5
12	3	4.5
1 P.M.	3	4.5
2	5	7.5
3	3	4.5

Tests were made using these draw-off schedules and the data are given in Table II. Column 16, Table II, gives the monthly gas consumption calculated by means of the formula, and Column 17 gives the actual gas consumption. The percentage difference between the calculated and actual gas consumptions is given in the last column, 18, and indicates an agreement to within approximately 7 per cent which is considered sufficiently close for practical purposes.

[1] Another phase of this problem is treated in a paper by W. R. Teller, American Gas Association Monthly, June, 1935, page 214.

TABLE II

(1) Test No.	(2) Heater Size V Gals.	(3) Daily H_2O Usage G Gals.	(4) Room Temp. °F	(5) Average Thermostat Range °F.	(6) t_2 (5)-(4) °F.	(7) Weighted Average Inlet H_2O Temp. °F.	(8) Weighted Average Outlet H_2O Temp. °F	(9) t_1 (8)-(7) °F.	(10) Cw 135°F. %	(11) Standby Loss S %	(12) Heat Content of Gas H B.t.u./Cu.Ft.	(13) Actual Burner Rate q B.t.u./Hr.	(14) First Term of Formula Cu.Ft. to H_2O	(15) Second Term of Formula Cu.Ft. Standby	(16) Monthly Gas Consumption (14)+(15) Cu.Ft.	(17) Actual Gas Consumption Cu.Ft.	(18) *Difference Between Calculated and Actual $\frac{(16)-(17)}{(17)} \times 100$ %
A	20	50	77.6	147.8	70.2	75.0	152.1	77.1	60.5	8.85	501	19000	3010	1490	4500	4157	+8.3
B	20	50	77.3	147.8	70.5	73.1	152.85	79.75	60.5	8.85	499	18500	3110	1498	4608	4446	+3.6
C	32	50	76.0	149.65	73.65	69.76	152.98	83.22	65.22	7.13	497	30700	3060	2030	5090	5270	—3.4
D	32	50	76.25	149.65	73.4	76.33	156.15	79.82	65.22	7.13	496.6	32600	2950	2020	4970	5300	—6.2
E	32	75	76.7	149.65	72.95	76.3	159.5	83.2	65.22	7.13	502	30500	4500	1990	6490	6970	—6.9
F	32	75	76.7	149.65	72.95	74.8	159.3	84.5	65.22	7.13	501	31800	4645	1990	6635	7011	—5.4
G	32	50	75.7	149.65	73.95	77.78	149.49	71.71	65.22	7.13	500	31650	2630	2020	4650	4525	+2.7

* (+) Sign indicates: Calculated M.G.C. > Actual M.G.C.

Test A indicates that the actual gas consumption was 8.3 per cent lower than the calculated monthly gas consumption. In this test, however, the recorded gas consumption was lower, by an unknown amount, than the true gas consumption, due to the *fact that during the test the water level in the wet meter fell below the proper value resulting in the meter reading low.* Therefore, if a correct gas consumption had been obtained, the difference between calculated and actual gas consumptions would have been less then 8.3 per cent.

III. Factors Used in Monthly Gas Consumption Formula

A. THERMAL EFFICIENCY. The monthly gas consumption formula derived above applies to the case in which a given quantity of water (G gallons per day) is heated in one operation of the burner through t_1° F., i.e., through the difference between the outlet and inlet water temperatures. This manner of operating a water heater would seldom, if ever, be encountered under service conditions. Therefore, the monthly gas consumption of a water heater determined by means of the formula is an approximation, the accuracy of which depends, among other things, upon the choice of a proper value of "operating" thermal efficiency.

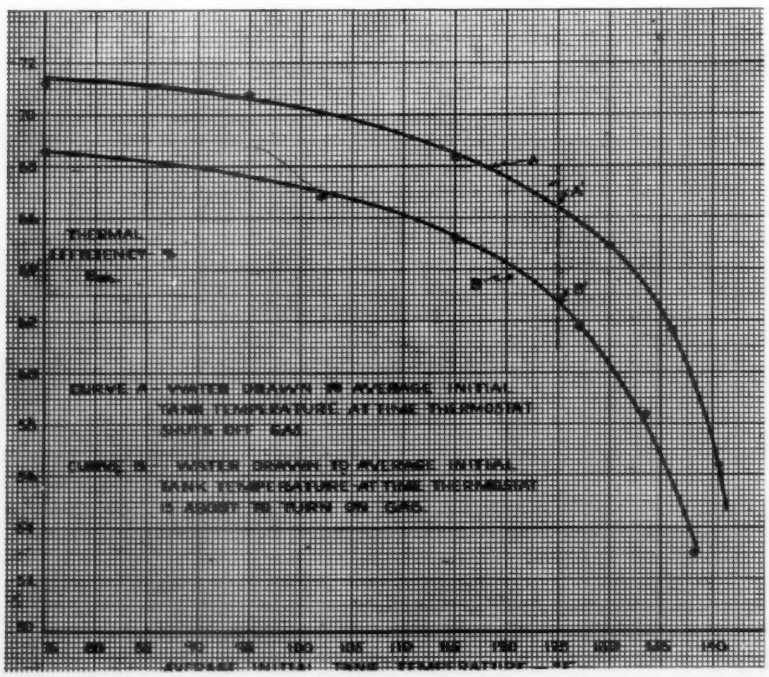

THERMAL EFFICIENCY - %
CURVE A - WATER DRAWN IN AVERAGE INITIAL TANK TEMPERATURE AT TIME THERMOSTAT SHUTS OFF GAS
CURVE B - WATER DRAWN TO AVERAGE INITIAL TANK TEMPERATURE AT TIME THERMOSTAT IS ABOUT TO TURN ON GAS

Figure 1

Fig. 1 shows the effect, on the uncorrected thermal efficiency, of heating a given quantity of water from different average initial tank temperatures to the shut off point of the thermostat. The upper curve A shows the values of the thermal efficiency obtained when the determinations were made immediately after shut-off of the burner by the thermostat. The parts of the heater were therefore at an elevated temperature, when the thermal efficiency tests were made. The lower curve B was obtained for the case in which the thermal efficiency determinations were made just before the thermostat opened, and the heater parts had cooled during the standby period. These curves indicate that bringing the parts of the water heater up to operating temperature results in lower operating thermal efficiency. The intercept of curve A with the ordinate gives the value of thermal efficiency obtained in accordance with the A. G. A. method, and for the particular heater illustrated in Fig. 1 had a value of 71.4 per cent. It will be noted, however, that this thermal efficiency obtains only when heating of the contents of the tank starts from the temperature of the inlet water (75° F. in this case). Any heating from a higher initial temperature occurs at lower thermal efficiency. For example, in the partic-

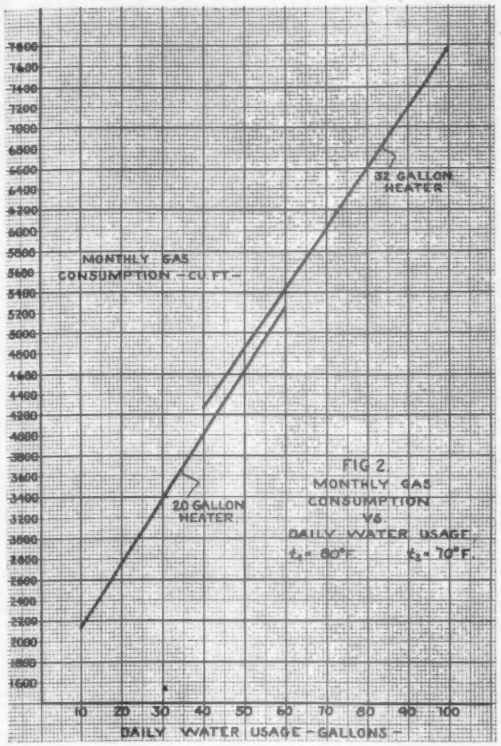

MONTHLY GAS CONSUMPTION - CU. FT. -
32 GALLON HEATER
20 GALLON HEATER
FIG 2
MONTHLY GAS CONSUMPTION VS DAILY WATER USAGE
t_1 = 80° F. t_2 = 70° F.
DAILY WATER USAGE - GALLONS -

Figure 2

ular heater represented in Fig. 1, the thermostat shut off the gas when the water temperature was approximately 150° F., and opened at approximately 138° F. Therefore, in normal standby operation, this heater operates with a thermal efficiency somewhere between 53 and 60 per cent, the values of curves A and B at approximately 138° F.

From the above, it may be seen that the value of thermal efficiency to be used in the monthly gas consumption formula should not be the value obtained by the A. G. A. method, since the effect of each withdrawal of water from the heater is to cause operation at a thermal efficiency that is higher the larger the withdrawal. Therefore, it is necessary to select a value of thermal efficiency for use in the formula that will approximate the average value obtaining during normal use of the heater. This is not as difficult as it may seem, as it was found from draw-off tests that sufficiently accurate results could be obtained when a value of thermal efficiency was used that was the average of the values indicated in Fig. 1 at A′ and B′ for curves A and B, respectively, corresponding to an average initial tank temperature of 125° F. It should be noted that the curves of Fig. 1 do not apply to the tests on the 20- and 32-gallon water heaters given in Section II. Fig. 1 applies to a 20-gallon heater of the same make, but of earlier vintage than the other heaters tested.

B. TEMPERATURE RISE OF WATER. The temperature rise of the water in the storage tank enters the formula as t_1, and is the difference between the outlet and inlet water temperatures. In determining the value of t_1, to be used in the formula, the temperature of the water at each draw was weighted and the average of all of the draws was used. For example, if 10 gallons of water were drawn at 150° F. and five gallons at 140° F., the average weighted temperature for the two draws would be

$$\left(\frac{150 \times 10 + 140 \times 5}{15}\right) \text{ or } 146.6° \text{ F.}$$

Thus, the value of t_1 was based on the weighted average obtained during the complete draw-off program, and is equal to the difference between the weighted average outlet water temperature, and the weighted average inlet water temperature.

C. TEMPERATURE FOR STANDBY LOSS. The standby loss involves the difference in temperature between the stored water and room temperature, and enters the formula as t_2. It was found that sufficiently accurate results are obtained when the value of the stored water temperature is based on the average of the thermostat opening and closing temperatures. Thus,

$$t_2 = \frac{t_{open} + t_{closed}}{2} - t_{room}$$

D. BURNER RATE. In the tests indicated in Table II, the actual burner rate, q, was substituted in the formula instead of the nominal rating given by the manufacturer. These values are indicated in Table II, in Column 13.

E. HEAT OF COMBUSTION OF GAS. In the comparison of the calculated and actual gas consumptions, the actual heat of combustion of the gas, H, was used in the formula. Column 12 of Table II gives the values used.

IV. Application of Monthly Gas Consumption Formula

A. A convenient method of using the monthly gas consumption formula is indicated in Fig. 2, which shows the calculated monthly gas consumption for various daily water usages for the two water heaters studied in this work. The conditions under which these calculations were made were for a temperature rise of the water, t_1, of 80° F., and for a difference between stored water and room temperature, t_2, of 70° F. The heat of combustion of the gas was taken as 500 B.t.u. per cubic foot. The characteristics of the two heaters are given in Table III, together with the operating data.

As an example of the use of the formula, the following calculation is included for one of the points in Fig. 2. This calculation is for the 20-gallon heater when supplying 50 gallons of water per day.

$$(4) \qquad h = 8.33\ VSt_2 = 8.33 \times 20 \times .0885 \times 70 = 1032$$

$$(7) \quad \text{M. G. C.} = \frac{250\ Gt_1}{H\ e_{at}}\left(1 - \frac{h}{q}\right) + \frac{720h}{H}$$

TABLE III.

Size of Heater	e_{at} (125° F.)	S	q	t_1	t_2	H
20 gals.	.605	.0885	20,000	80° F.	70° F.	500
32 gals.	.6522	.0713	30,000	80° F.	70° F.	500

$$= \frac{250 \times 50 \times 80}{500 \times .605}\left(1 - \frac{1032}{20{,}000}\right) + \frac{720 \times 1032}{500}$$
$$= 3140 + 1486$$
$$= 4626 \text{ cu.ft. per month.}$$

In Fig. 2 the maximum daily water load for each of the heaters was taken as three times the tank capacity, and is the value suggested by the manufacturer as a safe daily load. Under favorable conditions, however, the maximum capacity of each of these heaters may exceed this limit, and no service difficulties would be encountered.

Curves similar to those in Fig. 2, but for other operating temperatures, may be plotted, resulting in a family of curves from which the monthly gas consumption may be taken for any daily water usage under any desired operating conditions.

B. Another useful application of the formula is the determination of the change in gas consumption when the thermostat setting is changed. For example, suppose in the above case, the 20-gallon water heater has its thermostat setting lowered 5° F. Then $t_1 = 75$; $t_2 = 65$, and the thermal efficiency increases slightly but for our calculation no change will be made in $e_{ut.125°}$

(4) $$h = 8.33\,VSt_2$$
$$= 8.33 \times 20 \times .0885 \times 65$$
$$= 960$$

(7) M. G. C. $$= \frac{250\,Gt_1}{H\,e_{ut}}\left(1 - \frac{h}{q}\right) + \frac{720h}{H}$$
$$= \frac{250 \times 50 \times 75}{500 \times .605}\left(1 - \frac{960}{20{,}000}\right) + \frac{720 \times 960}{500}$$
$$= 2950 + 1390$$
$$= 4340 \text{ cu.ft. per month.}$$

Incidentally, these calculations indicate that lowering the temperature of the stored water 5° F. results in a reduction in gas consumption of 286 cu.ft. per month, when the daily water usage is 50 gals., the temperature conditions are as above, and the heat of combustion of the gas 500 B.t.u. per cu.ft.

V. Summary

In Section I a formula is derived for the monthly gas consumption of a water heater making use of the characteristics of the heater, and the conditions under which the heater is to operate. In Section II, test data on two water heaters are given in which the gas consumption was determined under daily water loads of 50 gallons and 75 gallons. The actual gas consumption as determined by these tests is compared with the calculated gas consumption in Table II, and it is shown that these agree to within about 7 per cent. Table I gives the draw-off schedules under which the tests were made.

In Section III, the values of the various terms are discussed that enter the monthly gas consumption formula. It is shown that the value of thermal efficiency to be used in the formula is not that obtained by the A. G. A. method. A sufficiently accurate value for the "operating" thermal efficiency is obtained by averaging the thermal efficiency obtained when the water is heated to the cut-off point of the thermostat from an initial tank temperature of 125° F. when one determination is made just after the thermostat has shut off and another is made just before the thermostat is about to open. Fig. 1 shows the values of thermal efficiency obtained for different average initial tank temperatures, and the "operating" value is indicated as the average of the efficiency at points marked A′ and B′, respectively.

The difference in temperature between the stored water and room temperature, t_2, should be based on the average of the on and off temperatures of the thermostat and room temperature.

The formula is applied to the two heaters previously tested, and curves are given in Fig. 2 showing the monthly gas consumption as plotted against daily water usage. The operating conditions, temperatures, efficiencies, etc., together with sample calculations, on which these calculations were based are discussed in Section IV and are given in Table III. The effect of reducing the thermostat setting is shown by a calculation using the formula.

They Could Take It

HOW gas ranges are put through a veritable torture chamber to insure their ability to "take it" was shown to delegates who visited the (Cleveland) Laboratory. The delegates witnessed some of the 500 separate tests to which gas ranges are subjected to secure the Laboratory's approval.—*The Utilitarian*, Wisconsin, October, 1937.

"Space Heating" Becomes "Direct Heating"

WITH the recent change in name of the Gas Space Heater Division of the Association of Gas Appliance and Equipment Manufacturers, a movement is under way in the gas industry to substitute and popularize the use of the term, "direct heating" in place of what has heretofore been described as "space heating." This change in terminology has considerable support within the industry, where the term "space heating" has caused considerable confusion in the past.

When the regulations for testing gas appliances were originated, a name had to be selected to cover the large group of heating appliances other than boilers and furnaces. The name selected was "space heaters." It took many years before this term was in general use in the trade that was involved in selling gas heaters. Outside of the profession directly concerned, the term has never been accepted.

Architects, builders and engineers usually use the term "space heating" to designate the heating of any given space, whether it is an office building or a modest dwelling. They use the term regardless of the type of equipment and the method of heating. It appears logical that such use of the term "space heating" is the correct use. Certainly it is well known that in the gas industry much time and many needless words have been spoken and written in efforts to expain just what is meant by "space heaters."

During the past several years some portions of the industry have been using the terms "direct heating" and "direct heaters" to cover this field. These terms have attained considerable acceptance. In marketing circles the use of the words "direct heating" has aroused new sales interest. The word "direct" means a lot in a sales sense as it immediately suggests simplicity and efficiency.

It is suggested that the gas industry generally should adopt the term "direct heating" and take steps to standardize its use in describing a distinct form of heating for which gas is the ideal fuel.

Professor Edwin F. Church, Jr.

Below—Class photographed during a lecture period. Included are: P. Bischoff, J. L. Boccio, L. R. Marino, H. Walther, E. Lenaham, F. Ferber, H. Mullady, J. Abramoski, E. J. Swillo, R. Hughes, R. W. Holcombe, V. S. Sandstrom, R. Williams, J. Dichart, A. N. Biasi, Prof. J. A. Lambertine, R. E. Larson, George H. Bennett, E. E. Wilson, T. Flynn, E. Harwine, J. Harmon, E. C. Holland, J. R. Musto, R. A. Delapierre, F. A. Goepfert, R. G. Kopff, H. R. Benavides

Making Better Gas Men

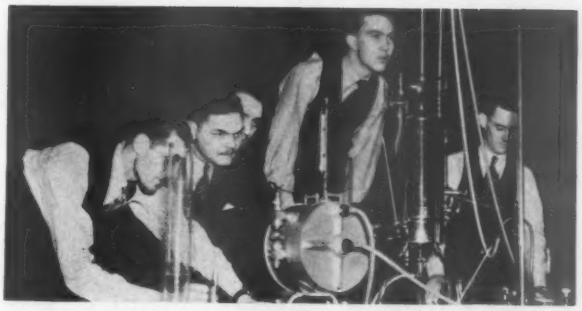
TWO evenings a week for seven months a group of employees of the gas companies in the New York area spend their time and energy to make themselves better gas men. They are students in a comprehensive course in the elements of gas engineering conducted by the mechanical engineering department of the Polytechnic Institute of Brooklyn, N. Y., under the direction of Professor Edwin F. Church, Jr., head of the department. At the conclusion of the present term, 383 men will have completed the course in the eleven years of its existence.

The course consists of twenty-eight lectures in which the fundamental principles underlying the production, distribution and utilization of gas are presented, together with a broadly sketched continuity of current gas company practice. In addition, there is an accompanying series of twenty-two laboratory sessions, illustrating and applying these principles, in which the students actively participate. Five personally conducted inspection trips to different gas plants and representative commercial and industrial installations show the students the latest in gas manufacture and utilization.

Lectures deal systematically and progressively with the properties of gas, heat, gas production, chemical control, distribution, combustion, domestic and industrial utilization, accounting methods and public relations.

Quizzes and assigned problems are given and, upon satisfactory rating at the completion of the course, suitable certificates are awarded. Some company executives provide special classes in which prospective students are prepared before undertaking the course. Instruction is given by the regular teaching staff of the Institute, assisted by executives, specialists and engineers from the gas industry.

An alumni organization, Polytechnic Alumni Gas Engineering, has been formed by those who have completed the course.



Students making calorimetric determinations

Professor Lambertine, left, supervising calorimeter tests. On the right, Professor Slack and a group operating an air thermometer

Determining humidity with a psychrometer

Photographs by A. Gordon King

1937 Water Heater Contest Ends; New Sales Drive Planned

THE final curtain rang down on the 1937 Water Heater Contest on September 30, but the generous flow of prizes brought joy to many an eager salesman for several weeks after; and then the golden flood of $3,200 divided among the final grand prize winners began.

The Golden Faucet Contest started February 1 and continued for nine consecutive months. Although the individual prizes for salesmen of the utilities for each month's most successful effort were stimulating and highly acceptable, they were not the only ones to benefit. All the gas companies participating secured substantial increases in their water heating load, and the home owners obtained greater comforts and better living conditions than before.

Final winners of the grand prizes are shown in the following list together with the cash awards which they received. Of course, these awards are in addition to the $10 awards which were collected from month to month for top-flight sales performance.

Div. 1—OVER 100,000 METERS

1st prize $100.00—P. V. Hilton, Washington Gas Light Co., Washington, D. C.
2nd prize $80.00—F. W. Bond, Washington Gas Light Co.
3rd prize $60.00—N. S. Stinchcomb, Washington Gas Light Co.
4th prize $55.00—R. H. Hyde, Washington Gas Light Co.
5th prize $50.00—L. E. Campbell, Washington Gas Light Co.
6th prize $45.00—L. P. Humphries, Washington Gas Light Co.
7th prize $40.00—T. D. Snyder, Washington Gas Light Co.
8th prize $35.00—D. W. Burrell, Washington Gas Light Co.
9th prize $30.00—T. C. Stocksdale, Washington Gas Light Co.
10th prize $25.00—F. Cummings, Milwaukee Gas Light Co., Milwaukee, Wis.

Div. 2—50,000 TO 100,000 METERS

1st prize $100.00—J. Healy, Central New York Power Corp., Syracuse, N. Y.
2nd prize $80.00—Joseph Marnell, Central New York Power Corp.
3rd prize $60.00—H. B. Conlin, Central New York Power Corp.
4th prize $55.00—E. H. Howard, Central New York Power Corp.
5th prize $50.00—B. J. Coulon, Atlanta Gas Co., Atlanta, Ga.
6th prize $45.00—J. A. Layden, Elizabethtown Consolidated Gas Co., Elizabeth, N. J.
7th prize $40.00—A. S. Keimig, Elizabethtown Consolidated Gas Co.
8th prize $35.00—B. Horton, Central New York Power Corp., Syracuse, N. Y.
9th prize $30.00—A. J. Bassett, Hartford Gas Company, Hartford, Conn.
10th prize $25.00—H. King, Atlanta Gas Light Co., Atlanta, Ga.

Div. 3—20,000 TO 50,000 METERS

1st prize $100.00—R. A. Dummer, Blackstone Valley Gas & Electric Co., Pawtucket, R. I.
2nd prize $80.00—N. C. Rushlaw, Blackstone Valley Gas & Electric Co.
3rd prize $60.00—A. J. Berard, Fall River Gas Works Co., Fall River, Mass.
4th prize $55.00—A. L. Pierce, Blackstone Valley Gas & Electric Co., Pawtucket, R. I.
5th prize $50.00—I. E. Adams, Fall River Gas Works Co., Fall River, Mass.
6th prize $45.00—M. J. Singiser, The Harrisburg Gas Company, Harrisburg, Pa.
7th prize $40.00—Chas. M. Seacombe, Long Island Lighting Co., Mineola, N. Y.
8th prize $35.00—L. J. Gammache, Delaware Power & Light Co., Wilmington, Dela.
9th prize $30.00—O. S. Webster, New York Power & Light Corp., Albany, N. Y.
10th prize $25.00—A. B. Marchand, Fall River Gas Works Co., Fall River, Mass.

Div. 4—7,500 TO 20,000 METERS

1st prize $100.00—L. A. Brown, Iowa Public Service Company, Waterloo, Iowa
2nd prize $80.00—A. A. Jalbert, Blackstone Valley Gas & Electric Co., Woonsocket, R. I.
3rd prize $60.00—H. E. Matthews, Blackstone Valley Gas & Electric Co.
4th prize $55.00—D. E. Fraser, Gary Heat, Light & Water Company, Gary, Ind.
5th prize $50.00—Wm. Groos, Texas Public Service Co., Austin, Texas
6th prize $45.00—Alfred Falcon, Cedar Rapids Gas Company, Cedar Rapids, Iowa
7th prize $40.00—H. F. Massey, Houston Natural Gas System, Houston, Texas
8th prize $35.00—G. T. Light, The Stamford Gas & Electric Division of Conn. Power Co., Stamford, Conn.
9th prize $30.00—C. W. Edmonds, Mountain Fuel Supply Co., Salt Lake City, Utah.
10th prize—$25.00—Don Millburn, Cedar Rapids Gas Company, Cedar Rapids, Iowa

Div. 5—2,500 TO 7,500 METERS

1st prize $80.00—W. E. Hill, The Argus Pipe Line Co., Omaha, Nebr.
2nd prize $60.00—P. Cunningham, The Greenwich Gas Company, Greenwich, Conn.
3rd prize $55.00—E. V. Bowyer, Lynchburg Gas Company, Lynchburg, Va.
4th prize $50.00—R. F. Purcell, Crystal City Gas Company, Corning, N. Y.
5th prize $45.00—R. L. Simms, Tyler Gas Service Company, Tyler, Texas
6th prize $40.00—J. P. McDermott, Minnesota Northern Natural Gas Co., Omaha, Nebr.
7th prize $35.00—T. B. Traverse, Central New York Power Corp., Watertown, N. Y.
8th prize $30.00—A. A. Hicks, Minnesota Northern Natural Gas Co., Omaha, Nebr.
9th prize $25.00—Thos. Heffernan, New York Power & Light Corp., Amsterdam, N. Y.

Div. 6—1,000 TO 2,500 METERS

1st prize $70.00—M. C. Overley, Central New York Power Corp., Oswego, N. Y.
2nd prize $55.00—L. W. Parr, Mountain Fuel Supply Co., Salt Lake City, Utah
3rd prize $50.00—E. F. Chamberlain, Consumers Power Co., Hastings, Mich.
4th prize $45.00—J. M. Killpack, Mountain Fuel Supply Co., Provo, Utah
5th prize $40.00—V. T. Kennedy, Rochester Gas & Electric Corp., Canandaigua, N. Y.
6th prize $35.00—D. F. Rauch, The Gas Service Co., Monet, Mo.
7th prize $30.00—G. G. Green, Clearwater Gas Dept., Clearwater, Fla.
8th prize $25.00—Wm. E. Cheney, Central New York Power Corp., Utica, N. Y.

Div. 7—LESS THAN 1,000 METERS

1st prize $70.00—Bert G. Brown, The Kansas Pipe Line & Gas Co., Norton, Kans.
2nd prize $55.00—Al Payne, The Kansas Pipe Line & Gas Co.
3rd prize $50.00—J. S. Pierce, Public Service Co. of Colorado, Denver, Colo.
4th prize $45.00—H. D. Brady, Public Service Co. of Colorado
5th prize $40.00—E. J. Jennings, New York State Electric & Gas Corp., Owego, N. Y.
6th prize $35.00—E. J. Lee, Public Service Co. of Colorado, Longmont, Colo.

7th prize $30.00—G. B. Borin, Public Service Co. of Colorado, Denver, Colo.
8th prize $25.00—Wenzel Waller, The Kansas Pipe Line & Gas Co., Norton, Kans.

The dealers have also shown their mettle and the winners have been announced. In this section the grand prize for each section was a Pontiac automobile with merchandise prizes for the other places.

Comparative results of this year's contest and last are very encouraging. The average number of companies participating increased 67.2% and sales increased substantially. Three hundred and sixty-three gas companies reported and the questionnaire sent to them definitely revealed that the contest stimulated the sales forces to a greater sale of automatic gas water heaters during 1937.

A study of the records of the last three years also indicates that the number of salesmen specializing in the sales of water heaters, as well as the number devoting part of their time to water heater sales, has been increased with marked acceleration. The total of water heaters sold during the 1937 contest showed an increase of 41.9% over the results reported in the 1936 contest.

The following 21 companies won bronze plaques of merit in prize series No. 4:

Division 1

1st—Washington Gas Light Co., Washington, D. C., H. M. Brundage, Jr.
2nd—United Gas Corp., Houston, Tex., D. A. Strickland.
3rd—Cincinnati Gas & Electric Co., Cincinnati, Ohio, F. S. Dewey.

Division 2

1st—Atlanta Gas Light Co., Atlanta, Ga., J. W. Lea.
2nd—Central New York Power Corp., Syracuse, N. Y., T. P. Federer.
3rd—Public Service Co. of Colo., Denver, Colo., R. G. Munroe.

Division 3

1st—Blackstone Valley Gas & Electric Co., Pawtucket, R. I., W. E. McCreery.
2nd—Memphis Power & Light Co., Memphis, Tenn., W. H. McInnis.
3rd—Houston Natural Gas Co., Houston, Tex., W. S. Keenan.

Division 4

1st—Houston Natural Gas System, Houston, Tex., W. S. Keenan.
(Outside City of Houston)
2nd—Mississippi Power & Light Co., Jackson, Miss., L. M. Taylor.
3rd—Cedar Rapids Gas Co., Cedar Rapids, Ia., A. L. McKinstry.

Division 5

1st—Peoples Natural Gas Co., Omaha, Nebr., R. L. Harrison.
2nd—The Argus Pipe Line Co., Omaha, Nebr., R. L. Harrison.
3rd—Lynchburg Gas Co., Lynchburg, Va., E. V. Bowyer.

Division 6

1st—Mountain Fuel Supply Co., Salt Lake City, Utah, S. E. Cowan.
(Wasatch Natural District)
2nd—Southern Union Gas Co., Bellville, Tex., H. C. Frizzell.
3rd—Washington County Gas Co., Johnson City, Tenn., H. W. Gee.

Division 7

1st—The Kansas Pipe Line & Gas Co., Norton, Kans., Lyle Quakenbush.
2nd—Public Service Co. of Colo., Longmont, Colo., R. G. Munroe (Denver).
3rd—Public Service Co. of Colo., Brighton, Colo., R. G. Munroe (Denver).

Water Heater Committee Prepares To Launch 1938 Program

COMBINING forces for their third intensive automatic gas water heater sales drive, representatives of the A. G. A. and A. G. A. E. M. at a meeting in New York, November 16, approved final campaign plans for 1938. With "Everybody Wins" as its keynote, the new program will extend from January 1 to October 31—two months longer than last year's Golden Faucet Contest.

According to R. E. Williams of the Binghamton Gas Works, Chairman of the National Water Heater Committee, the 1938 activity will be based on an entirely new method of distributing awards. Every participant will be assured of winning one or more prizes in direct proportion to his efforts. Every man will compete with nobody but himself.

"Using this new prize plan," Mr. Williams declared, "we are confident that many smaller companies will decide to enroll this year. No longer will gas companies be rated, in their sales efforts, according to their division. It is also believed that the new program of distributing awards will stimulate retail water heater dealers to greater, and more constant, sales efforts." Mr. Williams is supported in this opinion by H. N. Ramsey of the Welsbach Company, who has cooperated with Mr. Williams on the 1938 plans.

As in the two previous campaigns, the activity of gas companies and retail water heater dealers will be conducted independently, although both classifications will operate on the same prize basis. The A. G. A. will supervise the Gas Company division. Retail dealers will be directed by the A. G. A. E. M.

In its selection of sales methods for 1938, the National Water Heater Committee has been guided by results of the 1936 and 1937 drives. Using a contest plan during those two periods, the Committee watched heater sales records being established in 1936—and saw those marks shattered by the still more successful activity of 1937.

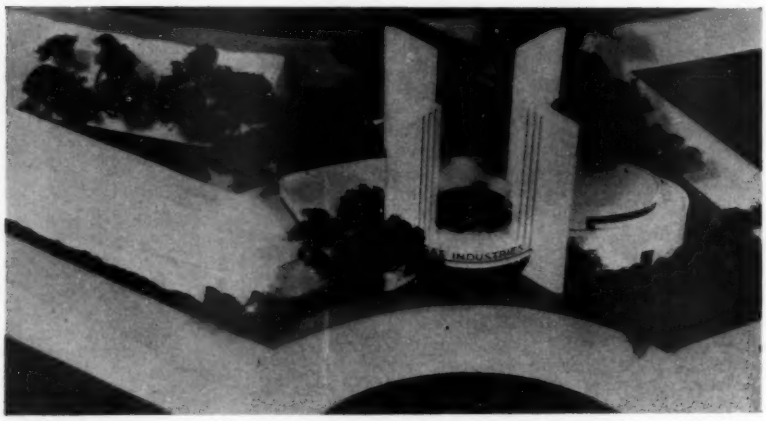
With this first-hand knowledge of the effectiveness of the various sales principles used, the committee improved on its choice of sales helps and agreed unanimously on the new prize distribution plan for 1938. This plan, incidentally, is in no sense a contest.

As in the past, gas company executives will be offered a variey of sales aids to supplement their regular programs. Retail water heater dealers will be encouraged to take advantage of all sales help offered by their respective manufacturers.

With final details of the 1938 campaign already in the production stage, complete information on the new program will be released the latter part of December. At that time, gas companies and retail dealers will receive detailed instructions on how to join successfully in the ten months' activity. Subsequent mailings will keep all participants posted on the progress of the program.

With the increased cooperation their new prize program is expected to win, representatives of the A. G. A. and A. G. A. E. M. look forward to a new high sales level in 1938.

Gas Industry Plans for the New York World's Fair



Model of Gas Exhibits' building at New York World's Fair 1939

ARCHITECTURAL plans for a gas building and animated exhibit to cost $750,000 at the New York World's Fair 1939, were made public October 31, by Grover A. Whalen, president of the Fair Corporation.

In addition, Mr. Whalen disclosed that The Brooklyn Union Gas Company and the Consolidated Edison Company of New York are spending $375,000 for gas mains and service preparations for the Fair, and that the gas exhibitors have purchased $1,250,000 of Fair debentures, raising the total participation of the industry to $2,375,000.

Court of Flame

The gas building will stand on a plot of 87,042 square feet in the Community Interests Zone on a wide avenue radiating from the Theme Plaza, the focal point of the main exhibit area of the exposition. The plot is S-shaped and 460 feet long. Its main entrance, at one end, will lead into a wide circular "Court of Flame" in which a large jet of gas will be kept burning like a torch. Four 90-foot pylons, suggestive of the grid points above the burner of a gas range, will rise high above the building and aid in forming the enclosure of the "Court of Flame."

At the other end of the building, in a three-sided patio shaded by trees, there will be a model all-gas house. It will present in working condition the various applications of gas in the home, for cooking, refrigeration, space and water heating and air-conditioning. All of these appliances will be of the latest and most efficient type.

Within the main structure an auditorium seating 350 persons is to be used to demonstrate the household use of gas and the presentation of educational programs by lectures, motion pictures and otherwise.

The gas industry intends going a step further in display of its products. Departing from previous custom, all gas appliances exhibited in its building are to be shown in the surroundings they would have were they in actual use. Devices used in kitchens will be displayed in reproductions of modern kitchens, heaters and air-conditioning mechanisms will be exhibited in basements or cellars, their usual emplacement in homes. Thus, the industry feels, there will be an additional opportunity to demonstrate new economies of space and new conveniences of arrangement of its various devices.

The gas building is to be erected by Gas Exhibits Incorporated, an organization of several hundred utility corporations and manufacturers of household gas appliances. An adequate crew is to be organized to provide guides and guards throughout the structure.

Hugh H. Cuthrell, vice-president of The Brooklyn Union Gas Company, is president of the exhibiting corporation. Its board of directors is composed of ten utility company executives and an equal number of executives of appliance manufacturing organizations. Its office is at 60 East 42nd Street, New York City.

The building was designed by Skidmore & Owings, John Moss, associate. The required engineering work will be done by Morgan, Hamel & Engelken.

The Brooklyn Union Gas Company and the Consolidated Edison are servicing the Fair with gas in accordance with contracts signed by the Fair Corporation. Gas will be available for every building throughout its 1,216½ acres. The work of laying the mains and distribution system has rapidly progressed and is being continued daily.

Gas for the Fair will be brought in 12-inch mains from the great holders of Newtown and Flushing. They will enter the Fair Grounds at two points on Grand Central Parkway Extension and thence be carried throughout the site in mains of 8-inch, 6-inch and 4-inch diameter from which the smaller distributing pipes will lead to consumers' meters.

Installation of this elaborate system necessitates laying two miles of mains from the holders to the grounds and 13 more miles of smaller mains within the site, a total of fifteen miles.

Message to Plumbing and Heating Trade

IN a special all-gas number, the *Plumbing and Heating Trade Journal* for November featured a section devoted to gas equipment and many articles by leaders of the gas industry. In addition to an account of the recent A. G. A. convention in Cleveland, the issue contained articles on many phases of the industry with particular emphasis on equipment and the need for cooperation between the gas industry and the plumbing and heating trade.

N. C. McGowen, president of the American Gas Association, addressed the following message to the plumbing and heating industry:

"You who are in the plumbing and heating business and we in the gas business have one objective in common—success. In the gas industry, we must accomplish this end by selling more gas. In your business, sale of gas appliances represents an important part of your profit possibilities.

"There never would have been one foot of gas sold unless someone had first sold an appliance, and there never would have been a gas appliance sold unless someone had made gas available to be used through the appliance. This interdependent relation between the gas industry and the plumbing and heating trades affords a real opportunity for cooperation and mutual profit. Neither your business nor ours can achieve maximum success alone. Cooperating in mutual understanding, however, we can work together in our markets toward success.

"The cooperative idea has taken root in the gas industry and is growing. In certain sections of the country, cooperation is an accomplished fact. Surely this beneficent movement will spread throughout the gas industry and the plumbing and heating trades, to the ultimate good of all of us.

"In my term of office I shall be earnest in promoting to my utmost the growth of the cooperative attitude among member companies of the American Gas Association and all allied industries."

The issue also contained feature articles by William T. Rasch, retiring president of the A. G. A. E. M.; Alexander Forward, managing director, A. G. A.; R. M. Conner, director, A. G. A. Testing Laboratories; H. P. Morehouse, chairman, Committee on House Heating and Air Conditioning; R. E. Williams, chairman, Water Heating Committee; Hall M. Henry, chairman, Refrigeration Committee; and R. F. Cleary, chairman, A. G. A. E. M. Direct Heater Division.

Your Association—

What It Is *and* What It Offers

VII

THE most startling statistics in the gas industry are currently being made in the industrial and commercial fields. Gas sales in these fields are fully justifying the Industrial Gas Section's slogan, "The Trend Today Is to Gas, the Modern Fuel." Compared with 1932, industrial and commercial natural gas sales are up 74.7 per cent, and similar sales for manufactured gas are running 54.7 per cent above the low depression figures. Sixty-three per cent of all gas sold is for industrial and commercial purposes. It is an indisputable fact that an industrial partnership of the first magnitude has been set up between gas and industry and commerce.

An important factor in this amazing progress has been the concerted program of research development and sales promotion carried on by the Industrial Gas Section of the Association. The Section's activities are concerned with gas applications running the gauntlet from drying hair in beauty parlors to open hearths, annealing and other applications in steel mills. Its projects necessarily cover a maze of industrial and commercial activities—in fact wherever heat is required in industry.

Organization of this Section is provided for in the Constitution of the Association. Its affairs are directed by a chairman and vice-chairman, elected by the individual membership of the Section. The chairman is a sectional vice-president of the A. G. A. The officers act under the general supervision of a Managing Committee which is composed of chiefs of industrial and commercial departments of gas companies and representatives of manufacturers of industrial and commercial gas equipment. The executive work of the Section is carried out by a secretary who is a member of A. G. A. headquarters staff. Present individual membership of the Section is approximately 800 men.

Eugene D. Milener has been a member of A. G. A. headquarters staff since 1928. At that time he organized the extensive program of research and development in industrial gas utilization which he still supervises under the direction of the Committee on Industrial Gas Research. In 1935 he organized a program of fundamental research in domestic gas utilization under the direction of the Committee on Domestic Gas Research. This work, which Mr. Milener supervises, is now concentrated on domestic ranges and water heating. F. J. Rutledge, of Philadelphia, has been chairman of both these research committees from their inception. Mr. Milener is also secretary of the Industrial Gas Section; secretary of the General Committee on Association Activities and secretary of the Committee of Executives on Air Conditioning.

Eugene D. Milener

A graduate of Baltimore Polytechnic Institute and of the University of Maryland in Business Administration, Mr. Milener also studied engineering at The Johns Hopkins University. He is Grand President of Delta Sigma Pi fraternity. He was one of the first men to complete the Trustees Gas Engineering Course and the Utilization Course of the old National Commercial Gas Association.

Starting in the gas business in Baltimore in the gas-lit era, he was one of a small group of pioneers who introduced central house heating by manufactured gas. Before joining the A. G. A. staff he was employed by the Consolidated Gas Electric Light and Power Co. of Baltimore.

As chairman of the first Appliance Requirements Committee for Central Heating Gas Appliances, the appliance requirements for central heating were developed under his supervision. More recently methods for applying gas to summer air conditioning by the dehydration method were developed and applied under his direction.

In 1915-16 he devised and first applied what is known as the Degree-Day method of calculating the heating requirements of buildings, regardless of climate. A leading technical magazine in commenting recently on the anniversary of the Degree Day stated that "it today ranks second only to the B.t.u. as a useful unit for the heating and air conditioning engineer."

In 1931 Mr. Milener in a paper first classified the four factors that constitute winter air conditioning and the four factors that constitute summer air conditioning. This classification has since become standard throughout the air conditioning industry.

He has written extensively on gas utilization and industrial subjects and has delivered many papers before national organizations.

At no time have the Section's activities been more closely tied in with industry than at present. Consider for a moment some of the points where the Section contacts industry and commerce on behalf of its members and how valuable information is disseminated.

In the first place continuous programs of advertising, publicity and industrial and commercial trade exhibits are being carried on. These are all designed along national lines and are carried out with the industry as a whole constantly in mind.

The industrial and commercial phases of the national advertising campaign are handled throughout by the Section. For the Association year 1938 these advertisements will appear in 13 trade and business periodicals of countrywide distribution and will cover five important heat-using industrial and commercial classifications. Special copy is prepared to best bring home the story of gas to each industry which is included in the list.

Informative publicity is a necessary and valuable adjunct to promoting any product or service under present-day business conditions. To keep gas in the forefront as industry's best all-purpose fuel, publicity material is regularly prepared by the Industrial Gas Section and furnished to editors of trade and business

papers in a wide variety of industries. During the past 12 months material prepared by the Section's industrial staff writer has appeared in 30 business and trade magazines that cover specific industries from coast to coast. A total of 4,352 column-inches of material on industrial and commercial gas applications has been published during this 12-month period.

Under this program articles and news items describe the use to which gas is put, not only by small local concerns but by large nationally known organizations. New developments are brought to the attention of plant managers and engineers. Personalities, both among gas users and industrial gas engineers, are also brought to the attention of readers in connection with outstanding developments and new and unusual uses of industrial and commercial gas. Most of this material is fully supplemented with photographs showing striking applications of gas.

The Industrial Gas Section is carrying on a continuous campaign to show gas companies the value of industrial and commercial gas window displays. The experiences of companies who have found such window displays to be highly worthwhile are gathered and reports made to the membership. This year a complete illustrated bulletin on industrial and commercial window displays was published and distributed throughout the industry.

Gas Exhibits

Each year the Section conducts displays or cooperates in six or seven national trade and business expositions, all of which are concerned with industries in which gas fuel is an important factor. These are attended by a total of approximately 125,000 people. The most recent industrial gas exhibit was held last month in Atlantic City at the National Metal Exposition and National Metal Congress. It occupied more than 5,000 square feet in the municipal auditorium and 12 leading industrial gas equipment manufacturers cooperated.

The basis of sectional activities is committee work. It is through committee work that individual members of the Assocation pool their personal and company experiences for the benefit of the industry. In the Industrial Gas Section each activity is handled through a responsible committee composed of men who are thoroughly representative of the best thought of the industry. Their reports contain data and information, that, through the years, act as an advance guard for industrial and commercial practices.

Sales Utilization Work

Sales promotion committees and committees that devote their efforts to the more important utilization subjects constitute a large part of the Section's work. In this latter category are the following committees: Volume Water Heating, Steam Generation, Gas Engine Power, Ferrous Metals, Non-Ferrous Metals, Ceramic Industries, Wholesale Baking, Food Manufacturing, Commercial Cooking and Baking, General Commercial, and Industrial Air Conditioning. Each of these committees is making valuable contributions to the industry.

Periodic service letters are sent to all members of the Section. These cover pertinent sales and utilization subjects. The Section also conducts two national sales conferences each year. One is devoted to industrial gas sales and the other to general commercial and hotel and restaurant sales. Subjects are presented and digested by experts in specialized fields and papers given at these conferences are widely reprinted in trade and business magazines.

Meetings of the Industrial Gas Section at the annual conventions have been outstanding from the standpoint of interested discussion of a wide array of vital subjects. The annual Proceedings contain a vast amount of valuable information on industrial and commercial gas subjects which has been presented at these meetings. An innovation on this year's program was the holding of a series of forums devoted to different subjects, each under a separate leader. Speakers were confined to five minutes and discussion was encouraged from the floor, thus making it possible to cover many subjects and obtain a variety of viewpoints. The industrial gas meetings at the Natural Gas Department's annual conventions are organized and conducted by the Industrial Gas Section.

One of the most important phases of the Section's work has been the preparation and publication of a series of industrial gas handbooks, each devoted to a different subject. In order to improve the application of gas for industrial purposes, progressive engineers are constantly suggesting and trying out improvements and changes in the methods of using gas equipment. From time to time such changes are reported in the various trade and technical journals. Such information is scattered, however, and is not easily collected or remembered.

Industrial Gas Handbooks

In order to correlate the latest data on industrial gas utilization methods, and to provide a complete picture of the various industrial applications, the Industrial Gas Section undertook several years ago to prepare this series of handbooks. These include "Water Heating," "House Heating," "Combustion," "Steam Boilers," "Bakeries," "Hotels and Restaurants," and "Food Products." Each of these books, which are edited by a staff member in cooperation with a special committee, is designed to provide accurate information on gas applications, to show methods for estimation of size of equipment and cost of operation, and to furnish ammunition which can be developed into successful sales talks for those actively engaged in merchandising equipment. That these books have succeeded in large measure is indicated by the large number of copies which have been distributed to date and the frequency with which editions are exhausted.

The Industrial Gas Section cooperates with a number of state and regional gas associations. The Mid-West Industrial Gas Sales Council and the Metropolitan Industrial Gas Sales Council are directly affiliated with it.

Hale A. Clark, industrial engineer, Detroit City Gas Co., is chairman of

the Industrial Gas Section. Frank H. Trembly, Jr., assistant general sales manager, The Philadelphia Gas Works Co., is vice-chairman. The secretary is Eugene D. Milener. C. George Segeler is utilization engineer and J. B. Nealey is industrial gas staff writer and publicity director.

In addition to the above-mentioned activities, important fundamental research in the industrial gas field is being carried on under the supervision of general committees of the Association. This work is not within the direct jurisdiction of the Industrial Gas Section and will be discussed in a subsequent article.

A. G. A. Officers Attend Annual President's Dinner

Photos by King

Henry Obermeyer, chairman of the Publicity and Advertising Committee, took a radio to the President's Dinner to follow the program broadcast by the Consolidated Edison Co. of New York. At the right are officials of the Natural Gas Department talking over the year's program at the dinner. Left to right: E. H. Poe, secretary; Thomas R. Weymouth, vice-chairman; Robert W. Hendee, chairman

THE President's Dinner of the American Gas Association, held annually to enable the new section officers and staff members to become acquainted and to discuss plans for the year, took place November 22 at the Engineers' Club in New York. President N. C. McGowen acted as toastmaster and introduced the speakers who described various Association activities.

In his opening remarks, Mr. McGowen called attention to the closer association of the manufactured and natural gas branches of the industry, particularly in contrast to the period when he served as president of the Natural Gas Association of America. Mr. McGowen was the last president of that association when it joined with the American Gas Association in 1927.

Complete support of the appliance manufacturers in the new promotional projects now being inaugurated by the Association was pledged by Merrill N. Davis, president of the Association of Gas Appliance and Equipment Manufacturers. He reiterated the fact that there is no conflict of interest between the manufacturers and the gas companies and, therefore, they should work together for the advancement of the industry.

Walter C. Beckjord, vice-president of the Association, made a brief and inspiring talk, reaffirming his faith in the future of the gas industry.

Results of the national advertising campaign were discussed by T. J. Strickler, chairman of the Committee to Conduct National Advertising. He emphasized the importance of keeping the campaign sold to the industry as a vital part of any national promotional effort.

Among those who spoke briefly on Association affairs were: Alexander Forward, managing director; Robert W. Hendee, chairman, Natural Gas Department; H. A. Ehrmann, vice-chairman, Accounting Section; Frank H. Trembly, Jr., vice-chairman, Industrial Gas Section; J. V. Postles, chairman, Technical Section; Hugh Cuthrell, chairman, Commercial Section; Henry Obermeyer, chairman, Publicity and Advertising Committee, and George W. Bean, Washington representative.

Other guests included: Thomas R. Weymouth, vice-chairman, Natural Gas Department, and F. M. Goodwin, vice-chairman, Technical Section. D. H. Mitchell, chairman of the Accounting Section, and Hale A. Clark, chairman of the Industrial Gas Section, were unable to be present.

Members of the Association's headquarters' staff, in addition to Managing Director Forward, present were: H. W. Hartman, Kurwin R. Boyes, Charles W. Person, R. M. Conner, George W. Bean, E. H. Poe, Eugene D. Milener, C. G. Segeler, J. F. Quinlan, Paul Ryan, A. Gordon King, O. W. Brewer, and J. M. Beall.

Manpower Vital Factor in House Heating Sales

IN a thorough analysis of the gas house heating load, Hall M. Henry, Utility Management Corporation, addressing the Metropolitan House Heating Council at A. G. A. headquarters, New York, November 17, pointed out that house heating sales rose in almost direct proportion to the increase in manpower. More manpower is the crying need of the day, he stated.

He declared that rates were not as important as having adequate manpower and that the size of the company was not a vital factor. He advocated the hiring of one full-time house heating salesman to every 3,300 one- and two-family homes on the gas lines.

The study described by Mr. Henry involved principally companies of the Associated Gas and Electric system and indicated that the companies in this group were holding their own under present conditions but that selling and servicing costs were high.

He outlined a three-year program with the objective of increasing house heating saturation to five per cent of the total customers by 1941. This program involved reducing rates 20 per cent, increasing manpower two to three times, and increasing sales promotional activities. In connection with this latter, Mr. Henry advocated greater use of direct mail advertising.

Using a typical company as an example, he concluded that it was possible to attain the objective of five per cent saturation, assuming a rate of 50¢ per M cu.ft. of manufactured gas and a service cost of $20 per installation.

James Deeley, The Brooklyn Union Gas Company, is chairman of the Metropolitan House Heating Council.

In America, the collection of big audiences at demonstrations, is no longer regarded as an end in itself; the chief aim today is to attract as many newcomers as possible.—MRS. EILEEN MURPHY.

Direct Heating Men To Meet

PROMOTION and merchandising plans for 1938 will be discussed by members of the Direct Heating Equipment Division of the Association of Gas Appliance and Equipment Manufacturers at a conference to be held Thursday, December 2, at the Netherland Plaza Hotel, Cincinnati, Ohio.

R. F. Cleary, secretary of the Homestead Heater Company, Newark, N. J., will preside at the sessions at which marketing and statistical trends will be considered. Executives from various sections of the country will participate in the program emphasizing objectives and plans for the new year.

The division's participation in the gas industry's exhibit at the New York World's Fair in 1939 will also be outlined to the members.

Employees Honored for Notable Achievements

APPRECIATION of the many contributions to the company's progress made by its employees was expressed November 4 by The Brooklyn Union Gas Company at its thirteenth annual service emblem dinner. Approximately 725 employees and guests attended the dinner, the outstanding company affair of the year. Emblems and other awards were presented to 260 employees who during the past year performed some meritorious work or completed long years of faithful service.

Tribute was paid to these employees by President Clifford E. Paige who delivered the only address of the evening. Mr. Paige also briefly discussed various phases of the company's business. In his talk Mr. Paige called attention to the fact that 814 employees have served 25 years or longer. He related some of the outstanding achievements of employees, showing the capability for service to the public of the individuals and of the company.

The gas company's service honor roll of 814 employees consists of the following:

1 employee with service of 60 years
7 employees with service of between 55 and 59 years
10 employees with service of between 50 and 54 years
42 employees with service of between 45 and 49 years
51 employees with service of between 40 and 44 years
92 employees with service of between 35 and 39 years
208 employees with service of between 30 and 34 years
403 employees with service of between 25 and 29 years

Louis Backmann

Samuel Lesser

Thomas F. Neary

William O'Leary

Patrick Lavan

John J. McDonough

James Ryan

Mr. Paige presented the service emblems to the men who have been with the company 45 years or more. Vice-Presidents B. G. Neilson and Hugh H. Cuthrell made the presentation to those in the 25-year to 40-year groups as well as the McCarter bars, medals and certificates, the National Safety Council President's medals and the special awards. Albert T. Stampe, president of The Brooklyn Union Gas Club, presented the athletic awards and trophies. John J. Garland, assistant chief engineer, presided.

Frank H. Averill, of Ocean Grove, N. J., headed the list of 219 employees receiving gold service emblems. Mr. Averill, who is the oldest employee in point of service, received an emblem denoting 60 years of faithful work. Mr. Averill's brother, John S., who resides at 199 Cleveland St., Brooklyn, has completed 56 years of service.

Emblems denoting 55 years of service were presented to James H. Jourdan, Michael F. Egan and James P. Lyons. Mr. Jourdan is former chairman of the board and former president of the company. He retired this summer as chairman of the board, a post he had held since April 25, 1935. He served as president from 1914 to 1935.

The 50-year men, who received a scroll and a year's salary in addition to the emblem, are Charles A. Young, John J. Leonard, Herman Wendlandt, and John Gibbons. Mr. Young, who resides at 266 Sterling Street, is manager of the company's Brooklyn Branch. Mr. Leonard, who lives at 3405 Clarendon Road, is an inspector in the Customers Service Division. Mr. Wendlandt, who resides at 92 N. 9th Street, is retired, having been formerly employed as a dripman in the Williamsburgh Works. Mr. Gibbons, who lives at 316 11th Street, is also retired, having formerly been employed as a field watchman.

One hundred and two emblems were presented to employees who during the past year ended 25 years of service. Sixty-two emblems were awarded to 30-year employees, 21 to 35-year men; 13 to 40-year men, and 13 to 45-year men. The emblem contains stars representing years of service, each star denoting five years of service.

Nine employees received national awards for life saving, notably the McCarter Medal which is awarded by the American Gas Association for resuscitation by the use of the Schafer prone pressure method. The award is made possible by the generosity of Thomas N. McCarter, president, Public Service Electric and Gas Company, Newark, N. J.

In a letter to Mr. McCarter following the dinner, Mr. Paige wrote: "The high spot of the evening was the presentation of the McCarter Medals. Eight of our people received them. Since you first began this presentation, there have been 167 of our employees who have been awarded medals. The accumulative effect of this inspiration is incalculable. I write in appreciation of your generosity and to let you know that we are mindful of the hundreds of lives here and elsewhere which have been saved through your thoughtfulness. We are indeed grateful."

Louis Backmann, a chauffeur, received two national awards. He was presented a McCarter Medal for saving one life and a McCarter Bar for saving another life on a separate occasion.

A McCarter Bar was awarded to Samuel Lesser, a service man, who had won a McCarter Medal several years ago. McCarter Medals were presented to Thomas Neary, a Street Division foreman, and William O'Leary, a collector. McCarter Certificates, for assistance given in saving lives, were given to Patrick Lavan, a caulker; John J. McDonough, a meter reader, and James J. Ryan, a chauffeur.

Kenneth Krueger, a meter reader, and Raymond Kerr, a service man, were awarded the President's Medal of the National Safety Council.

In addition to the nine men who received national awards for life saving, five were given special awards from the company for their efforts to save lives. These five, who performed meritorious work though unsuccessful in their efforts to save life, were William Edelman, a collector; Milton D. McMann, a service man; Neil A. Meurlin, a collector; Arthur W. Schneider,

a collector, and Henry O. Zulauf, a collector.

Seven men, Martin Walsh, Walter Russell, Frederick Knapke, John G. Wuestman, Howard Ridner, Clement Restaino and Henry W. Smith, were awarded the company's citations for individual acts of heroism.

Fifteen men employed as indexers received special awards in appreciation of the service they rendered to the company in avoiding errors throughout 1936 while reading meters. They were Edmund A. Ashman, William P. Bartik, Hubert P. Bartlett, Walter E. Campbell, Charles V. Dillon, Lester T. Dillon, Patrick Harte, Frederick J. Holweg, John J. Keenan, Nils A. Nilsen, William J. Pennell, Louis J. Sander, William T. Snyder, Samuel A. Villani, and George P. Woll.

Five company chauffeurs obtained special awards in recognition of their having completed five years of driving without an accident. They are John Fraze, John Hillman, William Lyons, Daniel McDonald and James Smith.

Three employees were awarded gold emblems for being the best group in the company in the recent annual Prone Pressure Contest. They are Raymond V. Kennedy, James T. Smith and Edward J. McLellan, of Holder Distribution Division.

John Abrio received an award for winning an employee appliance sales contest.

Three employees were presented awards for individual athletic events. Edward A. Dombrowski was honored for being the leading batter in the baseball league. Thomas F. Sullivan and Mabel A. Castronova were given awards for being the leaders in the men's and women's bowling tournament.

Three cups were presented to athletic teams. The President's Trophy was awarded the Queens District team for baseball. The Henry E. McGowan Trophy was presented to the General Office team for winning the men's bowling tournament. The Arthur F. Staniford Trophy was given to the Customers Service Division team for winning the women's bowling tourney.

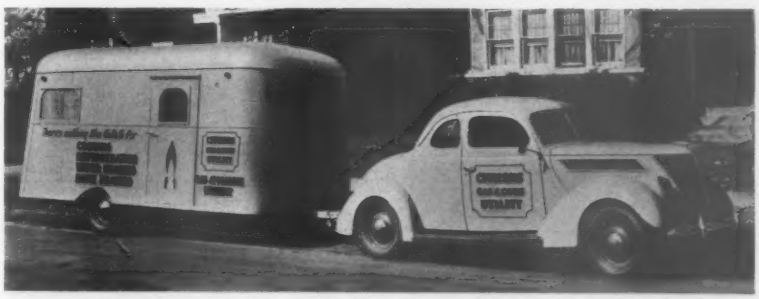
Veteran Gas Men Are Dead

TWO veteran employees of the Citizens Gas and Coke Utility, Indianapolis, died recently. Dudley N. Swartz, life-long resident of Indianapolis who served the city gas company for thirty-two years, died the latter part of October. He was superintendent of the water gas plant at the Prospect Street Plant at the time of his death.

Henry G. Winter, 80 years of age, employed by the Indianapolis Gas Company, predecessor of the Citizens utility, for 42 years prior to his retirement 22 years ago, died November 6 as a result of an automobile accident. Mr. Winter, who was plant superintendent at the time of his retirement, was active until the time of his death.

Gas Joins Travel Brigade

Attractive trailer carrying modern gas appliances used by the Brooklyn Borough Gas Company, Coney Island, N. Y., to promote interest in gas equipment. The trailer has been greatly admired by the company's customers and has resulted in an impressive number of leads to date



This new gas appliance exhibit trailer, recently put into service by the Citizens Gas and Coke Utility of Indianapolis, is expected to ease the problem of merchandising the utility's gas appliances to approximately 12,500 customers in suburban areas, according to F. G. Rastenburg, general sales manager. The sixteen-foot trailer, housing refrigerator, range, water heater, and radiant-fire models currently featured by the utility, operates on a schedule which includes several outlying districts in which gas lines have but recently been installed. The exhibit trailer service literally brings a miniature showroom to new gas customers at their very doors. All appliances in the trailer are connected for use, and facilities are included for the presentation of modern gas cooking demonstrations. The trailer may be parked for inspection by clubs and women's groups in any suburban neighborhood

Leading the simple life sensibly now means taking to the open road with a trailer boasting a kitchenette that houses such standard equipment as an automatic range, refrigerator and water heater, all operated with gas as the bottled fuel. This trailer was one of the great attractions at the recent auto shows in New York and other cities

The National Fuel Reserves

Dr. Fieldner

From Presidential Address of
DR. ARNO C. FIELDNER,
Chief, Technologic Branch, Bureau of Mines, before American Society for Testing Materials

DURING 1936 we produced and consumed 31 to 33 per cent of the world production of coal, 60 to 70 per cent of the petroleum, and 95 per cent of the natural gas. We have a little over one-half (3.2 trillion tons of coal and lignite) of the world reserves of coal, and probably 60 per cent of the proved oil reserves. Two-thirds of the oil produced in all countries since the discovery well was drilled in 1859 has come from American wells.

Unlike coal, estimates of the total national reserves of petroleum cannot be made. We can deal only with the proved reserves. In 1934, the United States Geological Survey estimated the oil in the ground recoverable by the current methods of production at 13 billion barrels, and the most recent estimate—that of January 1, 1937, by a committee of the American Petroleum Institute—puts the reserve at virtually the same figure. Thus, in the last three years discovery of new fields has kept pace with production. We cannot forecast future rates of discovery, and opinions differ as to when a decline will begin. Regardless of whether it may begin within one or several decades, it is evident that our oil and gas reserves are small compared to coal.

The deposits of oil shale, largely in the Rocky Mountain States, are estimated to contain a potential supply of 92 billion barrels of crude oil—an amount sufficient to maintain the present annual rate of oil production for nearly 100 years.

Natural Gas Reserves

The ultimate reserves of natural gas cannot be estimated. Fifty-five per cent of the natural gas is produced in association with oil; therefore, oil exhaustion means the end of natural gas from these particular areas. Reliable estimates of reserves of individual gas fields are being made, but this work has not covered the country as a whole.

Conservative estimates of the proved reserves by individual authorities range from 30 to 40 trillion cubic feet. Other estimates are placed at considerably higher figures. At the present rate of 2 trillion cubic feet of production per year, this amount would last 15 to 20 years. Here also, new sources will be discovered and the life of the fields, no doubt, will be extended greatly as growing social control will prohibit waste and low-grade use of this ideal form of our national fuel supply.

The original reserves of coal and lignite are estimated at 3.2 trillion tons—enough to cover the entire State of Ohio (area, 41,000 square miles) to a depth of 76 ft. Not more than 2 per cent of the original supply of bituminous coal and about 25 per cent of our anthracite has been exhausted. At the 1929 rate of energy consumption, assuming that coal will carry the load after oil, gas, and oil shale are exhausted, and allowing 30 per cent for loss, coal would last 2100 years.

However, there certainly will be an increase in energy demand; an increase at the rate of increase prevailing during the twenties would cut the period to some 500 years, and shortage of supply would be felt in the Appalachian field in 100 years. It must be remembered that the superior coals of the Eastern region comprise only one-seventh of the total reserves. One-half of the total reserve consists of subbituminous coal and lignite. These are inferior fuels, and they are in the western part of the United States, far from present centers of population. Moreover the bulk of the reserve consists of relatively thin or inaccessible beds which are more difficult to mine. Exhaustion of only 25 per cent of the anthracite deposits has increased considerably the cost of mining. The same situation will develop in the relatively near future with respect to the best bituminous beds, which permit low cost mining.

Advances in fuel technology have contributed greatly to the conservation of coal, but economic conditions in mining have worked against completeness of recovery. The avoidable losses of bituminous coal in time of business activity have been placed at 150,000,000 tons per year. Coal left behind is lost forever, and the prevention of the present wastes is a matter of national concern. Here, also, conservative methods of mining will bring efficient recovery in line with efficient utilization.

Fuels of Tomorrow

Gas, oil and coal are available today in abundance. There is coal enough for hundreds, and possibly thousands of years; but natural gas and oil obtainable by present methods may be exhausted in less than 100 years, and a shortage of our domestic supply may begin within 10 or 20 years. How will we meet this situation, and what will be the fuels of tomorrow?

An appraisal of present trends and future probabilities indicates that:

1. Coal will continue to be the principal fuel used for the generation of public-utility and major industrial power. Technologic improvements and new hydroelectric power will tend to reduce the consumption of coal; on the other hand, an increasing demand for energy and a decreasing supply of cheap residual oil will increase the amount of coal consumed for power purposes. No material change is expected in either direction in the near future, but in 10 or 15 years the trend will favor increased consumption of coal. Tomorrow's power and central heating plant will burn any kind of coal completely and efficiently. There will be no smoke, no dust, and no sulfurous gases emitted to the atmosphere.

2. No substitute has appeared for metallurgical coke. The coke-oven industry will expand and consume more coal in accordance with metallurgical needs, which are greatly affected by the supply of iron and steel scrap, but relatively few new installations for gas production can be expected in the near future on account of the availability of natural gas. Regulations prohibiting the waste of natural gas and the urge for additional markets will lead to the construction of more long-distance pipe lines from the producing fields to centers of consumption. This gas will find industrial and domestic use, and it will displace oil as well as coal. As natural gas approaches exhaustion, gas from coal will take its place.

3. The convenience and uniformity of automatic heating of homes with gas or oil will continue to attract more users, even at higher costs than those prevailing today. The insulation of houses has been improved greatly, and future homes will permit higher unit cost of fuel without increasing the total heating bill.

Stoker-fired domestic furnaces, now in their beginning, eventually will give automatic service at a lower cost than that for oil or gas. High- and low-temperature cokes will supplement anthracite as solid smokeless fuel. Smokeless fuels and automatic furnaces will clear the atmosphere of smoke in the better residential districts.

Just how the large low-income group which now burns raw coal will become users of the higher-priced smokeless fuels is not clear. Possibly, the municipality will subsidize plants for the production of smokeless fuels that can be sold for hand-fired furnaces and stoves at a moderate advance above the cost of raw bituminous coal.

On the whole, coal, because it is the cheapest fuel, will continue to contribute the major portion of the fuel used for house-heating and miscellaneous manufacturing, although further displacement by oil and natural gas probably will follow in the next few years.

THEY'LL BREAK THE LAW TO GET ONE

Burglars entered the premises of the Commercial Gas Company, Stepney, England, October 7, and stole a gas refrigerator, carrying it out boldly through a door.

Waukesha Discontinues Ice Engine Sales

THE Waukesha Motor Company, Waukesha, Wis., has announced discontinuance of the sale of the commercial ice machine known as the Waukesha ice engine. The company will continue the building of heavy duty internal combustion engines, notably the Deluxe automatic gas power units for air conditioning and refrigeration equipment and general power applications.

Code on Measuring Natural Gas

ANNOUNCEMENT has been made of the publication by the American Petroleum Institute's Division of Production of "API Code 50-A, Measuring, Sampling, and Testing Natural Gas (Tentative)." Development of the code, begun in 1932, has been under direction of the Division of Production Main Committee on Measuring, Sampling, and Testing Natural Gas and Natural Gasoline, with F. E. Rice, vice-president, Phillips Petroleum Co., Bartlesville, Okla., as chairman. Detailed considerations in measuring, sampling, and testing have been carried on by a technical subcommittee, Group 2, under the chairmanship of George P. Bunn, also of the Phillips Petroleum Co., Bartlesville.

The tentative code comprises standards and other practices selected from suggestions received from various sections of the industry and from trade associations and technical societies. While the scope is limited to production and trunk pipe line transportation, it is believed that present duplication of effort will be eliminated and simplification of procedure assured by the correlation of data.

Among organizations cooperating in development of the code were the California Natural Gasoline Association, the Natural Gasoline Association of America, and the American Gas Association. Chairmen of subcommittees aiding the work included D. M. Wolfe, Standard Gasoline Co., San Francisco, Calif.; Don Sillers, Lone Star Gas Co., Dallas, Texas; B. G. Williams, Southern California Gas Co., Los Angeles, Calif.; R. D. Turner, Skelly Oil Co., Tulsa, Okla.; L. G. Rheinberger, Sinclair Prairie Oil Co., Tulsa; and W. B. Berwald, U. S. Bureau of Mines, Bartlesville.

Work is near completion on "API Code 50-B, Natural Gasoline," under the technical direction of a committee headed by S. S. Smith, Shell Petroleum Corp., St. Louis, Mo.

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SEE YOUR
Every De Soto engine is given a Performance test before it is assembled in the car with
Natural
GAS FUEL
Natural GAS
is the only fuel used in the De Soto plant for industrial heating purposes
Go to the Gas

Window display shown at the office building of the Detroit City Gas Company during the month of November. Note automobile tie-in with industrial gas

Gas Booming in Australia

FOLLOWING are extracts from the Chairman's address at the annual meeting of shareholders of the Metropolitan Gas Company (Melbourne):

Gas ranges, gas water heaters and gas wash coppers are practically universal equipment in new buildings, with gas-fired space heaters becoming more popular than ever. As proof, in 2,920 new residences completed in the past twelve months, 2,883 have gas ranges; 2,203 gas water heaters and 2,359 gas wash coppers.

Sales of gas ranges by the company increased 11.2 per cent over the previous year. Sales of gas hot water heaters increased 38.3 per cent, and gas coppers 45.9 per cent.

There have been a number of gas-fired air conditioning installations. A feature, it was reported, has been "the popular development of console and other type warm air heaters for installation in halls of residences, churches, theatres, public and office buildings. The effect of these installations is to increase the temperature throughout the buildings as is done by central heating, but with only a fraction of the installation expense and operating cost of central heating. It is particularly pleasing to record that the majority of architects are now specifying and making provision for the installation of gas fires and space heaters, which are also proving increasingly popular for blocks of flat residences where fuel storage and handling is always a problem.

"The advent of the new models of 'Electrolux' gas-operated refrigerators at the end of the last refrigerator season is of first importance to the gas industry, as, wherever these remarkable appliances have been introduced in other countries, sensational sales have resulted. In New York, over a quarter of a million 'Electrolux' Gas Refrigerators have been installed in recent years, and in London over 80 per cent of the total domestic refrigerators sold last year were of this type. The modern Electrolux factory recently established in Melbourne is capable of supplying all local requirements, and it is confidently anticipated that the greatest demand for domestic refrigerators in Melbourne this year will be for the new gas models.

"Large increases have been shown in sales of all types of industrial equipment."

Theatre Art Suffers for Gas Lighting

THE New York *Herald-Tribune*, November 7, in a notice of the death of Sir Johnston Forbes-Robertson, famous actor and theatrical manager, quotes the following from remarks made by him two years ago:

"There is one thing that can never come back to the theatre, a thing that was one of its former beauties. That is the lighting. Today the scenic painters' beautiful art suffers terribly from the hard and crude effect of electric lighting, which is well enough as an adjunct, but as a *substitute for gas* is a hopeless failure."

Personal and Otherwise

Howard Bruce Heads Age Movement

THE November issue of *Nation's Business* contains an article "Baltimore Launches an Age Movement" by Howard Bruce, a former vice-president and director of the American Gas Association. The article describes the work of the Community Placement Bureau, Inc., in Baltimore.

Unique in the United States, the bureau has the dual purpose of obtaining employment for persons over 45 and, through education and publicity, to arouse public opinion to obtain real community cooperation in attaining its goal. Mr. Bruce who is president of the bureau is associated with Bartlett Hayward Division of Koppers Company, Baltimore.

Retires After 44 Years in the Gas Industry

Wm. DeFreitas

WILLIAM DEFREITAS, of the Sales Department of the Consolidated Edison Company of New York, Inc., retired on October 1 after forty-four years of service with the system companies. Prior to April 1 of this year, he was manager of the dealers' service division of the gas sales department.

"Billy" is one of the most popular veterans in the gas end of the business; he has thousands of friends in the company and in the gas industry at large.

He joined the Standard Gas Light Company on March 4, 1892. Prior to this he had been engaged in gas fuel and lighting appliance work with the W. M. Crane Company. In 1893 he was transferred to the Consolidated Gas Company as inspector of gas engines and governors. Later he became a stove clerk and one of the pioneers in the appliance business. In 1901 he was made assistant to W. J. Clark, superintendent of the General Fuel Appliance Department, and under Mr. Clark's direction he opened the company's first appliance department, in old 2 Irving Place. Women demonstrators were employed to teach the public how to use gas stoves—a radical departure in those days.

Mr. DeFreitas designed the municipal arc light which was used extensively for outside lighting and became superintendent of the Municipal Lighting Company in 1902. He designed the radiators in Grant's Tomb on Riverside Drive and the first successful hotel gas range.

He became a member of the Utilization Department staff in 1923, and manager of the Dealers' Service Division in 1928.

Mr. DeFreitas was for many years identified with the activities of the American Gas Association, and from 1919 to 1934 he assisted in promoting and staging the annual exhibitions of appliances and equipment held in connection with the Association's convention.

Lone Star Wins Cup for Advertising

Will C. Grant, left, advertising director, and W. G. Wiegel, advertising manager, Lone Star Gas System, receiving a silver loving cup from Noden Taylor, of the Dallas News *and the* Dallas Journal, *for the best institutional advertising produced in Dallas during the year*

A SILVER loving cup for the best institutional advertising in newspapers produced in Dallas during the past year was awarded the Lone Star Gas Company by the Dallas Advertising League on October 19 at the close of its annual "better copy" contest.

The winning ad was run in Lone Star Gas System newspapers last winter, according to Will C. Grant, advertising director, who received the award. It was entitled "Can He Play in Every Room?" and featured a picture of Marshall Newcomb, Jr. Copy for the ad was prepared by Willard G. Wiegel, Lone Star advertising manager.

In quarterly awards, also presented at the October 19 meeting, third place in the newspaper campaign division was awarded Lone Star Gas Company for a series used by Texas Cities Gas Company in El Paso, copy on which was prepared by L. C. Roberts, advertising department.

F. E. Sellman Appointed A. G. A. E. M. Treasurer

F. E. Sellman

F. E. SELLMAN, vice-president of Servel, Inc., has been appointed treasurer of the Association of Gas Appliance and Equipment Manufacturers to fill the vacancy caused by the death of the late Donald McDonald.

Active in the gas industry, Mr. Sellman has served on various committees of the American Gas Association since 1927. He is now a member of the managing committee of the Commercial Section, and also a member of its Refrigeration Committee.

Mr. Sellman is best known for his work in building up the prestige of the Servel Electrolux refrigerator through his connection with Servel, Inc., of Evansville, Ind., as that company's consulting engineer in the pioneering period of gas refrigeration and as its vice-president in charge of sales, advertising and sales promotion from 1931 to 1936.

During the N.R.A. period Mr. Sellman served on the Gas Appliance Institute Code Authority. He was one of the incorporators of the Association of Gas Appliance and Equipment Manufacturers of which he is now a director as well as treasurer. He is also a director of Gas Exhibits, Inc.

L. A. Brown Honored

TO celebrate his 25 years with the Iroquois Gas Corporation, executives and friends gave a dinner, November 13, for Leigh A. Brown, president. A surprise reception was also tendered Mr. Brown by officials and fellow employees at his office.

A graduate of Cornell University, Mr. Brown joined the Iroquois Natural Gas Co. as junior engineer in 1912. He became engineer in charge in 1918. When that company merged with the Niagara Gas Corporation, he became second vice-president and chief engineer of the present corporation. In February, 1929, he was promoted to first vice-president and became president in February, 1934.

When Mr. Brown started in 1912 the gas company had 66,389 consumers and 894 miles of transmission and distribution mains. It now has 184,990 consumers and 2,600 miles of mains.

Payne Elected Treasurer of American Meter Co.

F. H. PAYNE, president of American Meter Company, at a recent board meeting was elected also to be treasurer of the corporation thereby filling the vacancy created in that office by the death of Donald McDonald.

The vacant office of secretary was filled by the election of John Van Norden, formerly assistant secretary. Mr. Van Norden also was elected assistant treasurer, and will be in resident charge of the New York general offices at 60 East Forty-second street. He will continue his duties as manager of sales promotion.

Miss Viele Takes New Post

MISS GOLDIE C. VIELE, for a number of years assistant secretary of the Natural Gas Department at Dallas, resigned effective November 15 to become secretary to Captain A. E. Higgins, vice-president of the Pittsburgh Equitable Meter Company.

Miss Gladys Daulton, formerly of Tulsa, Oklahoma, but for the past three years with the Home Owner's Loan Corporation at Dallas, has been employed as successor to Miss Viele and has entered upon her duties. Miss Daulton was educated in the public schools of Tulsa, the University of Tulsa and the University of Colorado. She has had three years' experience in radio station KVOO in Tulsa.

Joins Houston Company

W. A. Hudson

WM. A. HUDSON, for several years general sales manager of the Birmingham Gas Company, has been appointed general sales manager of the Houston division of the United Gas Corporation, Houston, Texas, and will leave November 30 to take up his new position.

Charles B. Gamble, vice-president and general manager of the Birmingham Gas Company, expressed regret that the City of Birmingham was to lose a valuable citizen and the gas company so able a sales manager.

"Under Mr. Hudson's management," said Mr. Gamble, "Our sales department has won four national honors in the past five years. In gas refrigerator sales, his department won second place in a national contest in 1934, two first place awards in 1935, and third place in 1936. In 1936, they scored third place in a national contest in gas range sales."

Mr. Hudson is a graduate of Vanderbilt University. He is a director of the Southern Gas Association. He began his public utility career in 1925 as industrial sales engineer of the Birmingham Electric Company where he rapidly rose to position of manager, industrial gas division. When the gas and electric properties were separated in 1929, Mr. Hudson went with the newly organized Birmingham Gas Company and became its general sales manager in 1931.

J. A. Messinger Joins Buell Company

J. A. Messinger

JOSEPH A. MESSINGER, formerly of United Engineers & Constructors Inc., has been appointed general manager of the Buell Engineering Company, Inc. The office of the Buell Engineering Co., Inc. is at 70 Pine Street, New York, and the company, a subsidiary of the American Goldfields Development Company, is engaged in the sale of dust collecting systems.

Mr. Messinger, well known in utility construction circles, became associated with The United Gas Improvement Company on June 26, 1910. He supervised the construction of gas apparatus, both coal and water gas; power plants and gas distribution systems. He became assistant to the vice-president in charge of engineering of The U. G. I. Contracting Company and when United Engineers & Constructors Inc. was formed, he was placed in charge of the pipe line construction department, which post he held until his recent appointment.

Mr. Messinger has supervised the construction of many producing units and the laying of thousands of feet of gas transmission lines.

H. Sidney Smith Wins Society Awards

ANNOUNCEMENT has been made of the winning of two annual awards by H. Sidney Smith, well-known figure in the acetylene industry and long identified with the Union Carbide Company. The Samuel Wylie Miller Medal was awarded to Mr. Smith by the American Welding Society for meritorious contributions to the science and art of welding. He received the James Turner Morehead Medal for the year 1936 for "his vision, inspirational guidance and aggressive cooperation in the advancement of the acetylene industry." This medal is an award of the International Acetylene Association.

Mr. Smith has been responsible for many important developments in acetylene utilization. He has served as president of both the British Acetylene Association and the International Acetylene Association.

Laclede Gas Company Marks Century of Progress

THE Laclede Gas Light Co., St. Louis, Mo., held a "One Hundred Years of Progress" celebration October 18-28 in commemoration of the advance made by the gas industry since 1837, when the first St. Louis gas company was incorporated.

Numerous activities and events, to which the public was invited, were scheduled for the ten days' celebration.

Each evening during the celebration, the offices of the company were open and guides conducted tours through the various departments explaning how the activities are co-ordinated to provide an efficient service to more than 190,000 customers.

Exhibits were arranged showing the progress in gas appliances in the home and industry.

With nearly a century of continuous service to its credit, the Laclede Gas Light Co. ranks with the industrial aristocracy of St. Louis. The first gas company was incorporated in 1837 and the erection of the first gas plant was begun in 1841. Within approximately a year, gas was first distributed to the residents of St. Louis.

Twenty years later, two other gas companies were organized. One, incorporated March 2, 1857, was called the Laclede Gas Light Co., in honor of the founder of the city. The other, incorporated March 3, 1847, was called the Carondelet Gas Co., named for the section of the city which it was to serve.

At that time, the Laclede Gas Light Co. served that section of the city north of Washington Avenue and the St. Louis Gas Light Co. served that section of the city south of Washington Avenue except Carondelet. On May 22, 1880, the St. Louis Gas, Fuel & Power Co. was organized under the name of the St. Louis Heat & Power Furnishing Co., with a plant at Eighteenth Street, and Clark Avenue.

In 1889, the Laclede Gas Light Co. was reorganized and all the gas companies were brought under one organization and were thereafter known as the Laclede Gas Light Co.

In 1932, the Laclede Gas Light Co. introduced natural gas in St. Louis, brought through a pipeline 450 miles long, from the Monroe fields in Louisiana. In 1936, the Laclede Gas Light Co. distributed in St. Louis 5,703,864,000 cubic feet of this gas. During that year the company carbonized 307,406 tons of coal. The company also produced a total of 250,140 tons of coke in 1936, much of which was sold for domestic consumption in this city.

Bibliography on Coal and its Products

NEARLY 2,000 publications on the subject of coal have been prepared by engineers and chemists of the Bureau of Mines, Department of the Interior, since the organization of the bureau in 1910. The various items in this extensive library of coal are described in a bibliography just issued by the Bureau.

Coal, its production and use, has been a subject of laboratory and field study by the Bureau of Mines since its organization. The bibliography just published includes publications issued by the bureau, those written by its staff for the technical press, and reports of work done jointly with States, colleges and industries.

References are given under eighteen subject classifications; covering the occurrence, composition, properties, mining, preparation, and utilization by combustion, carbonization, gasification and liquefaction of coal. In addition there is included a complete index of subjects and an index of authors. Within each subject classification the papers are separated in groups based on the medium of publication and arranged in each group alphabetically by authors. Thus the user can find almost instantly all the publications of the bureau on any subject related to coal.

This 145-page bibliography is published as Technical Paper 576, "Bibliography of United States Bureau of Mines Investigations on Coal and Its Products, 1910-35," by A. C. Fieldner, Alden H. Emery, and M. W. von Bernewitz, and is for sale by the Superintendent of Documents, Government Printing Office, Washington, D. C., at a price of 5 cents per copy.

Goodbye, Bowl of Water

HARLEY Street (British medical center) would not use or advise the use of gas if it dried the air and caused stuffiness, staleness and the rest of it. All that has gone in the wind; fresh, everchanging air and perfect ventilation are indeed the points stressed by the newest types of gas heaters, and that bowl of water alongside as a corrective has vanished, with many another canard, into limbo.—*The Lady*, London.

Gas Industry Research

AS we see it, the research of the gas industry is now being turned into useful channels, and it is up to the gas industry at large to put into practice, without undue delay, the more favorable precepts which emerge from that research. That needs more courage and foresight than merely discussing, and possibly criticising, the work of those engaged on research; but unless the majority of gas men possess that courage and foresight, there is little point in going on with research.—*The Gas Times*, London, Nov. 6, 1937.

Mid-West Gas School and Conference

WITH a registration of 150, the seventeenth Mid-West Gas School and Conference held at Iowa State College, Ames, Iowa, reached its climax in the banquet held on Friday evening, November 12. Featured at the banquet was the barbequed elk prepared from an animal which was, to quote the toastmaster, "harpooned with a crowbar, lassoed with a log chain and shot with a cannon" by E. E. Brown of the Sonner Sales Company while on a recent hunting trip in Wyoming.

Outstanding in the program which was held November 10-13 was the half day devoted to demonstration explanation and discussion of Specialized Testing Equipment by F. A. Mueller, chemist, and C. F. Holdredge, engineer, Metropolitan Utilities District, Omaha, Nebraska.

Other papers presented were: Trends of Gas Distribution Pressure Regulation by Kenneth R. D. Wolfe; Gas Engine Power to Meet Electric Competition by C. E. White; Practical Methods of Proving Meters by Allen D. MacLean; Repairing Meters by C. B. Dushane; Basic Design of Instruments by L. K. Spink; Electrolysis of Pipe Lines by H. J. Carson; Unaccounted-For Gas—Effects of Change-Over by L. J. Eck; Gas Leaks—Their Detection and Repair by Robert L. Klar; Service Freeze-Ups by A. H. Abbott; Construction of Residence Chimneys by R. F. Galpin.

L. W. Mahone of Ames, Iowa, was chairman of the Program Committee.

Canadian Gas Association

ACCORDING to an announcement of the secretary-treasurer, George W. Allen, the thirty-first annual convention of the Canadian Gas Association will be held in Toronto, Ontario, Thursday and Friday, June 9 and 10, 1938. Convention headquarters will be at the Royal York Hotel. There will be no exhibition of gas appliances.

Mid-West Gas Association

ACCORDING to announcement of R. B. Searing, secretary-treasurer of the Mid-West Gas Association, the 33rd annual convention will be held at St. Paul, Minn., April 11-12-13. Arrangements for the program and entertainment features are already under way.

Convention Calendar

DECEMBER

6-7 **National Industrial Council**
Waldorf Astoria Hotel, New York, N. Y.

8-9 **National Association of Manufacturers**
Waldorf Astoria Hotel, New York, N. Y.

6-10 **American Society of Mechanical Engineers**
New York, N. Y.

6-11 **Exposition of Chemical Industries**
Grand Central Palace, New York, N. Y.

15-16 **Pacific Coast Gas Association, Fall Conference**
San Francisco, Calif.

1938

JANUARY

24-28 **American Institute of Electrical Engineers**
New York, N. Y.

24-28 **5th International Heating & Ventilating Exposition***
Grand Central Palace, New York, N. Y.

FEBRUARY

16-18 **Southern Gas Association**
Adolphus Hotel, Dallas, Texas

24-25 **New England Gas Association**
Hotel Statler, Boston, Mass.

MARCH

16-18 **American Association of Petroleum Geologists**
Roosevelt Hotel, New Orleans, La.

APRIL

11-13 **Mid-West Gas Association**
St. Paul, Minn.

13-15 **National Petroleum Association**
Cleveland, Ohio

17-21 **American Chemical Society**
Dallas, Texas

25-29 **Missouri Association of Public Utilities**

MAY

2-5 **U. S. Chamber of Commerce**
Washington, D. C.

9-12 **Natural Gas Department, A. G. A.**
New Orleans, La.

14-21 **Tenth International Petroleum Exposition and Congress**
Tulsa, Okla.

JUNE

9-10 **Canadian Gas Association**
Royal York Hotel, Toronto, Ontario

OCTOBER

Wk. 10 **American Gas Association**
Atlantic City, N. J.

* Includes exhibit sponsored by A. G. A Industrial Gas Section.

Accounting Section

D. H. Mitchell, Chairman H. W. Hartman, Secretary H. A. Ehrmann, Vice-Chairman

Practical Methods of Minimizing the Cost of Common Colds

By N. W. HAIGHT

Chairman, Subcommittee on Health Promotion Activities of the Office Management Committee

IN the June issue of the A. G. A. MONTHLY there appeared an article entitled, "The Common Cold—An Unaudited Expenditure," dealing with the cost to industry of the common cold. This paper also deals with the subject of common colds but is devoted to non-technical but proven practical methods and suggestions which have been beneficial in reducing or minimizing colds and their consequent costs.

The common cold and the illnesses directly attributable to it are unquestionably real items of cost. Loss in production by manufacturers due to the absence of skilled workers is possible to estimate but in the gas industry such cost, and particularly the cost of non-disabling illnesses, is virtually impossible of figure illustration. Nevertheless, this cost is known to exist and if it were calculable would probably be startlingly high. Therefore, the success achieved to date in the field of accident prevention gives rise to the hope that similar results in our efforts to reduce the toll attributable to the common cold can likewise be accomplished with equal success.

Medical Aid

Undoubtedly the advice to consult a physician at the first sign of illness is sound, but it can be likened to the old adage of closing the barn door after the horse has escaped. Human nature makes most of us pay scant attention to the value of health until ill health overtakes us. It is only then that we begin to realize the benefits of preventive measures and, sadly enough, they are readily forgotten as soon as normal health has been restored. It seems, therefore, that there is little room for doubt as to the wisdom of the employer if he can reduce illness among his employees and effect a reduction or minimize the cost from illness by taking steps to introduce intelligent preventive measures.

This is not in any way an attempt to discourage or advise against consulting a physician but merely an effort to stimulate activity on the part of employer and employee alike toward minimizing illnesses through neglect. There are numerous ways in which this can be accomplished and the following are some of the more practical methods.

Company Publications

Periodical company publications, whether they be multi-page papers, single-page issues, magazines, etc., are generally circulated to all or a large proportion of the employees and afford an excellent medium for employers to bring to employees' attention such items as they may desire. In certain larger industrial concerns, space is allotted to the medical department in each issue of their publication for short articles appropriate during the various seasons or otherwise. This, of course, is possible only in such instances where a medical staff is maintained. However, items of warning are not necessarily confined to medical knowledge, but are often merely suggestions for the exercise of common sense. This could be accomplished by short but to the point common sense suggestions, such as:

"Watch Out for Colds in February"
"Take Extra Care of Your Health in Wet Weather"

These items in company periodicals need not be lengthy or technical. As a matter of fact, lengthiness and technical language will in many cases destroy the value of the suggestions by limiting the number of persons who will attempt to read them. Short items properly set out so as to be easily noticed, with a point well taken, will generally receive far more attention and consequently be of greater value.

Perhaps even more effective than articles presented in the same manner as other written matter is the reproduction of posters, which are treated in detail under that heading.

Regardless of how often company publications are released, an appropriate article or suggestion on the subject of health can be included. However, every effort should be made to be certain that any item on this subject is timely, or else its effectiveness will be lost. Furthermore, constant use of such items should be made, as only in that way will the employees become conscious of the benefits possible to them by watching for and digesting the meaning of the suggestions proffered. Likewise, not until the employee has become aware of the necessity of safeguarding his health will the employer reap any reward.

Consider for a moment the expense of utilizing space in company publications for this purpose. For the amount of space required, paper cost, printing and presenting the article, it is doubtful whether the expense need even be considered. Therefore, if the partial use of such publications for this purpose averts only a few colds and resultant absences from work, it is at least a reduction of out-of-pocket expenditure and consequently justified, irrespective of the consideration of the employees who have been saved the discomforts and inconveniences so clearly identified with the common cold.

Posters

Perhaps nothing has been quite so effective in making employees accident-conscious as the use of posters. These posters were used with a great deal of success, not only for industrial accident but automobile accident prevention as well. If it were possible to obtain such success in that field, there should be equal success from their use in combating colds and related illnesses which, although not so readily adaptable to figure illustration, are equally costly.

Similar to the use of space in company publications, the preparation of posters need not be confined to those of a technical or professional nature, but may be of unlimited value by the use of common sense. The accompanying reproduction of a poster used is particularly emphatic and yet reflects a common sense practice which many are prone to forget unless reminded.

Here again, the expense involved is small when compared to the benefits possible of obtainment to both employee and employer. Constant, rather than infrequent,

use of posters is essential, as well as prominent display at advantageous points, in order to keep the thought in the employee's mind. Similarly, frequent changes of posters should be made and all posters should have the quality of attracting attention. Otherwise, their value will be nullified, as it may be assumed that where a poster is seen day after day by the same employees its value diminishes with the passing of time. Remember, too, that until employees become health-conscious the employer can expect to reap no benefit.

Ventilation

Air conditioning in all offices would perhaps make for ideal working conditions but due to its cost, installation of such a system makes it impractical in many instances. Nevertheless, periodic airing of offices at frequent intervals costs nothing. It is human nature, perhaps, that no two people in an office fully agree as to the temperature desired, with the general result that frequently such offices become hot and stuffy, a condition quite conducive to transmission of colds. It is well, therefore, to have periods during the day when windows are opened and the office aired. Generally it is well to assign a person or persons to this task from a service department, for if left to the office workers in the department it may not be accomplished with as much regularity.

Recreation and Exercise

Office workers as a class in general get less physical exercise than any other group of employees. Yet it is this class of employees which, because of their confinement in offices, should be more concerned about this than others. Not all companies are in a position to provide recreation centers, but all companies, irrespective of size, can sponsor some sort of recreational program. Such a program would naturally have to be sufficiently varied so as to include all possible employees. Numerous companies sponsor inter-departmental contests in addition to representative company teams of one sort or another. These inter-departmental activities frequently stimulate more interest and, of course, include more employees than could be possible by only one representative group for an entire company. The foregoing is primarily with reference to athletic contests but other recreational programs can be arranged requiring little or no physical prowess but which are equally successful in raising the health standards of employees.

Contests

In connection with industrial and automobile accident prevention campaigns, singular success was experienced by instituting inter-department and, in larger systems, inter-company contests. These contests were in a number of cases conducted on the basis of efficiency in curbing accidents and frequently the winners were awarded some trophy. The results of such contests far exceeded normal expectations in many instances and it is reasonable to believe that similar contests could be successful in minimizing and reducing illnesses. Contests of this nature have tended to add weight to the assertion that "employees are employees' severest critics," especially when comparative ratings are involved.

This method should be carefully watched, however, in order to safeguard against the possibility of employees working when they should be at home and in bed. Such a condition might easily develop an increase in illness instead of a decrease and therefore this plan should be carefully controlled.

Physical Examinations

Without criticizing the medical profession, more attention might well be given to original and periodic physical examinations of prospective as well as permanent employees. The practice of paying rural or even city physicians, by those companies without medical staffs, on a per examination basis is not particularly beneficial in that it has a tendency toward cursory examinations, especially of those people who present a normally healthy appearance. Perhaps a wiser method might be a retaining fee wherever practical, based on the prior six or twelve months' experience. Such a method has been successfully operated by some companies for several years.

For those companies maintaining full- or part-time medical staffs, periodic physical examinations of employees have definite advantages, and even in such cases where company physicians are not maintained, the cost of providing employees with the opportunity of having such examinations at company expense will prove beneficial to both employee and employer.

Conclusion

The foregoing suggestions as possible media toward accomplishing a reduction in out-of-pocket cost largely neglected are general in nature but practical of use. Circumstances, locality, etc., would necessarily govern the detailed operation in the adoption of any or all of these methods. However, it should be borne in mind that particular thought has been given toward presenting suggestions involving generally little expense, yet offering possible benefits now overlooked. Such being the case, it is a question of whether you can afford to pass over these without trial and not whether you can afford to institute some new policy. It is, of course, impossible in this paper to say what toll the common cold and related illnesses are extracting from each company, as only an analysis of individual situations would begin to disclose this fact. However, it is possible to say with a considerable degree of accuracy that the results of individual company analysis would indicate conditions in this connection that would practically make mandatory the establishment of some means to effect a reduction of this cost.

Accounting Classification and Retirement Units Listed

AT its recent convention the National Association of Railroad and Utilities Commissioners approved and recommended the adoption by individual state regulatory comissions of a uniform list of Retirement Units the purpose of which is to establish the point of differentiation between maintenance and replacement of property.

At the same meeting the National Association of Railroad and Utilities Commissioners approved and recommended certain minor revisions in the Uniform Classification of Accounts for Gas Utilities, the classification itself having been approved and recommended at the 1936 convention of the Commissioner's Association.

The State Law Reporting Company, 30 Vesey Street, New York City, the official agency for the National Association of Railroad and Utilities Commissioners in such matters, has recently announced the availability of printed copies of the approved lists of Retirement Units for Electric and Gas Utilities and of the revisions in the Gas Accounts Classification. The prices of the pamphlets which may be procured from the State Law Reporting Company are as follows:

List of Retirment Units for Gas Utilities	$.85
List of Retirement Units for Electric Utilities	.85
Revisions of the Gas Accounts Classification (in pamphlet form)	.25

Somewhat lower prices than those stated prevail for quantity purchases of either item.

Annual Report Form for Gas Utilities

THE new Annual Report Form for Gas and Electric Utilities is now available. Copies can be obtained at $3.00 each on request to Clyde S. Bailey, Secretary, National Association of Railroad and Utilities Commissioners, 7411-13-15 New Post Office Building, Washington, D. C.

Still Better

A self-styled reformer was watching a trench being dug by modern machine methods. He said to the superintendent:

"This machine has taken jobs from scores of men. Why don't you junk that machine and put one hundred men in that ditch with shovels?"

The superintendent promptly retorted: "Or better still, why not put a thousand men in there with teaspoons!"

During 1936, gas heating equipment was installed in 593 new homes in St. Louis County according to R. J. Vandagriff, assistant sales manager of The St. Louis County Gas Co., Webster Grove, Mo.

Commercial Section

Hugh Cuthrell, Chairman J. W. West, Jr., Secretary F. X. Mettenet, Vice-Chairman

Stimulating Dealers' Activities

• Digest of Address, by D. A. STRICKLAND, Sales Manager, United Gas Corporation, before A. G. A. Convention, Sept. 28, 1937.

IN our properties we became convinced that our maximum promotional and sales efforts would produce less volume of gas sales than would the combined promotion and sales efforts of our company and dealer sales organizations. Further, we were convinced that added gas sales activity could be obtained from dealers more economically than by addition to our company sales organization.

In the beginning the management of our company did not say what we would do or what we would not do. We were determined, however, to do two things: first, to cooperate fairly and, second, under no circumstances to subsidize any dealer. We believed then and know now that a worthwile dealer is engaged in the gas appliance business for profit and that he would become increasingly interested only by increased profit realized through hard work.

The Dealer Program

We had one man contact first our district managers and explain to them and through them to their organizations, the opportunity to increase gas sales through a cooperative company-dealer sales program. We discontinued the payment of commissions to salesmen, substituting a fixed salary. Salesmen were advised that they were full-time employees of a growing gas company and that their individual success depended on increased gas sales in their territory. They were encouraged to so do their job of selling gas that they would earn promotion to a more responsible position. Our entire organization subscribed to this dealer program and each employee actually signed his or her name to an employee's sales policy, thereby committing themselves to what we considered ethical sales practices.

Having sold the need for a dealer program to our company organization, this contact man, together with the district manager, contacted each dealer individually, announcing our desire to cooperate and frankly stating that it would in our opinion result in a mutual good. During this first interview we delivered to the dealer two papers, (1) our company's future policy as respects the sale of gas appliances; (2) our employees' sales policy as respects their efforts in selling gas appliances. We explained that employees had at our suggestion signed their names to these sales policies.

Needless to say we encountered many reactions. We received suggestions that have been valuable. We received criticisms of past happenings which were both founded and unfounded, but the important thing was we had the opportunity of washing up our dirty linen and pointing out a path of mutual advantage.

We became convinced that we should establish in our sales department a dealer sales director. We selected this man by virtue of his experience and training, which gave him the dealer point of view. We doubt if any utility man can fill this job because his past associations and interests affect his judgment. The man must be a dealer at heart. The fact that he is a company employee and therefore your representative will protect the company in the conduct of his work. The fact that he is, at heart, a dealer and sees sales through the eyes of a dealer will not only protect, but enlarge, your dealer program. Having selected such a man and created such a department for him, we now develop and execute sales plans from a company-dealer point of view, and we believe that this is essential to increased gas sales. It is the duty of our dealer sales department to promote sales through dealers just as it is the duty of our company sales department to promote sales through the company.

Personal Contact Vital

In personal contact alone lies the first secret of all successful dealer relations work. Our dealer man knows that he cannot simply write letters, valuable though they may be at times, and through them alone win the support of dealers. He also knows that no house organ or company publication alone can do the job, but that he must meet dealers face to face and talk with them, showing a knowledge of their problems and an interest in their welfare, demonstrating wherever he can the sincerity of the company's program, urging and educating company field managers to carry on these same contacts.

Additional support for the dealer sales director is desirable. Our company gets out a dealer newspaper, and sees that it is pointed editorially toward the interests of our dealers and not the company. When we initiate a new sales campaign, we make up a prospectus for the dealers and tell them the whole story of our plans. Our company advertising in all cases leaves the door wide open for dealers to tie in with our promotion. All ads carry the message "See Your Dealer." We advocate without reservation that no appliance brand names or identifying characteristics under any circumstances ever appear in the utility company general advertising. We offer dealers copies of the display materials which the company prepares for its offices, and provide sales training for dealer salesmen. We offer dealers the services of our home economists in holding demonstrations, following up sales with educational calls, assisting in salesmen's training, etc. We make available to dealers' customers the same service on appliances that we give our own appliance customers.

At this stage the dealer's attitude is favorable. It remains for him to be properly contacted by a manufacturer or distributor. In this respect we believe that the utility should encourage the development of the jobber or distributor method of distributing gas appliances so as to help the dealer to do a better job. Our conclusion is that if the dealer is alert to the possibilities of gas appliance sales, he almost invariably prefers the services which the distributor is able to provide to those afforded by the manufacturer, even though it costs him more money to enjoy such distributor services.

Gas Appliance Orders Increase in N. Y.

TOTAL gas appliance business obtained by Consolidated Edison Co. of New York in Manhattan, the Bronx and Queens for the first nine months of 1937 amounted to $3,494,405, an increase of 36 per cent over the same period last year. These figuers do not include gas equipment sold directly by department stores and dealers. Also there are no gas range sales included in the July, August, and September, 1937, figures as the company discontinued the sale of gas ranges July 1.

During September, this year, 257 sales of gas house heating equipment were reported and 230 water heaters were sold compared with 218 house heating sales and 176 water heating sales made in September, 1936. For the nine months period of 1937, gas heating sales totaled 935 and water heating 1,331 compared with 822 gas heating and 978 water heating sales in the corresponding period of 1936.

"Distinguished Neighbor" Parties Add Zest to Home Service Program

DO you know the "distinguished neighbors" of your community—the outstanding men and women who may live just around the corner? The Brooklyn Borough Gas Company, Coney Island, New York, has offered its customers a chance to meet these people, men and women whose successful careers or interesting hobbies offer stimulating and varied topics for other members of the community.

For instance, the Brooklyn Borough Gas Company invited Jo Ranson, well-known radio editor of the *Brooklyn Daily Eagle*, as one of its distinguished neighbor speakers last season. Mr. Ranson brought the class many vivid pictures of personalities behind the scenes of broadcasting. Rabbi Samuel Peiper also contributed interesting material. Always alive to community betterment, he aroused his audience to many necessary civic needs. Dr. Charles Mayrsohn, who lectures frequently on the care of the eyes, not only spoke at one of the evening Home Service meetings, but also exhibited his microscopic films on "Deep Sea Life Off the Bahamas" and "From Cocoon to Butterfly."

Varied Program

Feeling that variety would add sparkle and spice to the weekly programs, the Home Service Department endeavored to plan a diversion of topics. Slides on "Sunlit Norway" were featured in connection with a cooking demonstration with the theme, "Ship Ahoy! For a Bon Voyage Luncheon." The travelogue was presented by Mrs. Gladys Petch, outstanding radio speaker both here and abroad, who concluded a 25,000-mile lecture tour at the Brooklyn Borough Gas Company's "Distinguished Neighbor" party.

Various outstanding organizations, such as the Visiting Nurse, the Children's Court and the Volunteer Firemen, were also invited to send speakers. Nor were the local tradesmen forgotten. They gladly cooperated, offering a surprisingly fine example of neighborly friendliness. An Easter millinery show and a Spring fashion parade delighted the women members of the class. In May, another gay fashion show this time featured the cotton revival. Meanwhile, a local jeweler presented the romantic history of the "Finding and Cutting of the Jonker Diamond."

Scouts for talent were also kept busy. Members of the community having musical ability or dramatic aspirations were asked to perform. A one-act skit with a kitchen setting was presented by members of a dramatic club of one of the nearby churches. A lively song and dance revue starred pupils of a local dancing school. Employees of the gas company and members of the class joined together to present an amusing skit entitled "Jury Trial." The guest speaker for that particular evening was a young counselor at law, John Borrie, who first spoke on "Modern Trends in Law," and then took part in the skit which followed.

Of course, the cooking demonstrations have always been featured at all Home Service meetings. But beside the regular recipes for oven meals, refrigerator dishes, and well-planned menus which are stressed throughout the year, Mrs. Borrie and Miss Corcoran have found that menus for special holiday parties with their accompanying table settings have proven very popular with the home-makers.

The Wednesday evening classes have been continued for several seasons. The Brooklyn Borough Gas Company has made hospitality the password for these "Distinguished Neighbor" parties which have proven the open door to neighborly friendliness and community cooperation.

Home service class of the Brooklyn Borough Gas Company with Miss Irene Corcoran, left, and Mrs. Rae Borris presenting a demonstration

By EDITH LANGENAU

Brooklyn Borough Gas Company

Why Women Buy Gas Ranges

A SURVEY recently made by a gas company to find out the impelling forces that induced 282 women to buy new gas ranges shows some views of considerable interest. Buying a new range was a matter of immediate necessity for 146 women; 78 bought the new range because of its beauty and then found that it cooked better; 49 bought their ranges solely because of its beauty; and nine made purchases because they knew in advance that the new ranges cooked better.

In every one of these cases it is reported that the buyers were surprised and pleased by the superior performance of the new range. The survey also revealed decided preferences for certain features. Most women wanted automatic lighters for top burners, but only a little more than fifty per cent wanted lighters for oven burners. Considerably more than half of the buyers wanted flat top ranges, and about one-third of them wanted the oven above the range.

1927 A. G. A. Proceedings Wanted

A special request has been received for a copy of the 1927 American Gas Association Proceedings, the supply of which has been exhausted for some years. Anyone who is in possession of a copy for which he has no further use, please get in touch with R. C. Heard, division auditor, Southwest Natural Gas Company, P. O. Box 270, Ada, Oklahoma.

Industrial Gas Section

Hale A. Clark, Chairman Eugene D. Milener, Secretary Frank H. Trembly, Jr., Vice-Chairman

Gas Exhibit Focal Point at Metals Show

FOCAL point of interest at the National Metal Exposition of the American Society for Metals in Atlantic City, October 18-22, was the attention-compelling gas exhibit sponsored by the Industrial Gas Section of the Association in cooperation with gas companies and manufacturers of industrial gas equipment. The concensus was that this year's gas exhibit was outstanding.

Mass attendance at the Show was greatly augmented by the participation of the American Welding Society, the Wire Association and the American Institute of Mining and Metallurgical Engineers. As practically every industry is in some way tied up with metals, the attendance, which totalled 11,000, was drawn from every part of the country. Exhibitors showing represented a true cross section of American industry. Many industrial gas men availed themselves of this opportunity to contact customers from their own territories and demonstrate new industrial gas furnaces and equipment, both natural and manufactured on display in the industrial gas exhibit.

A distinctive layout and color scheme for the A. G. A. Combined Industrial Gas Exhibit was prepared under the direction of Raymond M. Martin, art director, Consolidated Edison Company of New York. Each of the 12 cooperating manufacturers limited his exhibit to a few pieces of gas equipment and was thereby enabled to give these items a better showing. At the four corners of two intersecting aisles was the circular A. G. A. booth, surrounded on four sides by the booths of the cooperating industrial gas equipment manufacturers. An innovation was the elimination of fences, partitions and back walls that made the gas exhibit much more effective and accessible. An attractive runner-sign bearing the slogan-chart "The Trend Today is to Gas" and other slogans encircled the top of the exhibit. There were approximately 87 gas equipment company officials, engineers and experts in attendance to answer questions.

The Committee on Displays at National Industrial Expositions of the Industrial Gas Section, who sponsored the gas exhibit, is composed of the following: H. A. Sutton, chairman, T. J. Gallagher, Paul Dorchester, C. C. Krausse, P. A. Nelles, Jr., A. A. Schuetz and Roy P. Wilson. Eugene D. Milener, secretary of the Industrial Gas Section, was director of the exhibit.

A general get-together breakfast was given by the Industrial Gas Section to the equipment manufacturers and members of the Managing Committee at the Ambassador Hotel, Tuesday morning, during the show.

Contact with customers, actual and prospective, to discuss sales of more gas and demonstrate equipment, brought gratifying results. Four gas men interviewed on this point gave enlightening answers. E. A. Esslinger, industrial gas sales supervisor, Cincinnati Gas & Electric Co., said that he discussed gas equipment with 15 customers who represented some of the largest firms in his city. A. T. Code, industrial gas sales supervisor, The East Ohio Gas Co., Cleveland, reported talking with 40 from his city. E. L. Spangel, Rochester Gas & Electric Corp., Rochester, N. Y., told of meeting up with 36 of his customers while George J. O'Neill, Pennsylvania Gas & Electric Co., York, Pa., stated that he spoke with no less than 30 industrial gas consumers from his town. Manufacturers reported that the number of inquiries and contacts from all sections of this country made the show more than worth the time and money expended on it.

A. G. A. Combined Industrial Gas Exhibit at the Metals Show

Most prominent features in the gas exhibit were gas radiant heat both direct and in the form of tubes; furnaces and ovens employing forced convection heat; atmosphere and atmosphere controls and automatic temperature controls interlocked with safety devices. Most of the exhibitors had full-size gas furnaces or gas burners lighted and going full blast.

Radiant heat gas burner heads in different sizes and capacities were displayed by Burdett Manufacturing Co., Chicago, Ill. Operating models demonstrated how these heads could be used with custom-built manifolds to throw the heat in any desired direction.

Featured among the lighted and hot furnaces of the American Gas Furnace Co., Elizabeth, N. J., was one adapted for "Ni-Carbing," a process for case hardening. This is a combination of nitriding and carburizing and samples of work, some of which had been treated in production, were on display. This process, it is stated, bids fair to displace cyanide hardening and can be used in various types of furnaces. The furnace on display was of the continuous shaker type and was under full automatic temperature control.

A gas burner requiring no blower or compressor was demonstrated in combination with lighted furnaces by Charles A. Hones, Inc., Baldwin, N. Y. No difficulty was experienced in bringing these units up to 2000 deg. F. There was also a gas-fired heater for preheating steel mill rolls shown by the C. M. Kemp Manufacturing Co., Baltimore. This heater consists of a circular shell holding a multiplicity of 1½" pipes into the ends of which gas burners fire. It is built in two halves so as to readily fit over the rolls in place.

Attractively displayed by The Selas Co., Philadelphia, was a new type radiant gas burner which gives a superior atmospheric control within the furnace. This burner consists of a ceramic tunnel and a ceramic head and no metal comes within the heating chamber. Its construction obviates any change in port size and therefore volume of heat input. A Flow-scope or flow indicator of great accuracy was exhibited by this company for the first time. This is designed to show exactly the amount of air and gas being taken to the appliance, thus aiding perfect atmospheric control.

Another new development was the gas-fired draw or tempering furnace of the forced convection type with recirculation shown by Eclipse Fuel Engineering Co., Rockford, Ill. Outstanding features are the narrow temperature gradient, elimination of maintenance and high production per unit of basket capacity. Firing with an atmospheric type burner eliminates the necessity for an auxiliary air blast.

Gehnrich & Gehnrich, Woodside, N. Y.,

Photographed at the Industrial Gas Section breakfast meeting during the Metal Show, left to right: Eugene D. Milener, New York, Frank H. Trembly, Jr., Philadelphia, Hale A. Clark, Detroit, H. A. Sutton, Newark, Alexander Forward, New York, and W. E. Steinwedell, Cleveland

S. C. Bain, president, American Society for Metals, congratulating H. A. Sutton (left) chairman, Committee on Displays, on the excellent gas exhibit

E. A. Esslinger, Cincinnati Gas & Electric Co., and Stanley Binns (left) Cincinnati Milling Machinery Co.

A few of the industrial gas men from different parts of the country demonstrating the latest gas equipment developments to their local customers. Left to right: A. D. Spillman, Philadelphia Electric Co., and R. Buechtino, Philadelphia Steel & Wire Corp.; G. J. O'Neill, Penn. Gas & Eectric Co., and Fred H. Lewis, The McKay Co., both of York; F. M. Reiter, The Dayton Power & Light Co., and R. P. Koehring, General Motors Corp., Dayton; H. H. Draper, The Philadelphia Gas Works Co., and T. A. Wiedemann, Wiedemann Machinery Co.

A. T. Code, The East Ohio Gas Co., and Gordon T. Williams, Cleveland Tractor Co., chairman, Cleveland chapter, American Society for Metals

C. S. Conkright, Public Service Electric & Gas Co., and Fred M. Miller (left) The Carborundum Co., Perth Amboy, N. J.

Photographs by J. B. Nealey

J. F. Czotter, Delco Brake Division, General Motors Corp., F. M. Reiter, The Dayton Power & Light Co., and Lawrence Jaffe, Frigidaire Corp.

showed a novel gas heater so designed as to require no refractories or insulation. It reduces heat-up time by 25 per cent, it is claimed, and eliminates maintenance. A new ribbon gas burner developed primarily for atmospheric low pressure gas applications was shown for the first time by Ensign-Reynolds, Inc., New York. Also shown for the first time was a complete line of atmospheric inspirators.

A rotary forging and heat-treating furnace with a positive water-sealed hearth and syphon vents was featured by special photographic views by The Gas Machinery Co., Cleveland. Both high and low pressure gas burners are used.

The Partlow Corp., New Hartford, N. Y., displayed a recently developed temperature recorder and recording control utilizing an inkless chart of especially prepared paper, not of the smoke chart variety.

Dry Cyaniding Process

Considerable interest was shown in a gaseous process for dry cyaniding featured by the Surface Combustion Corp., Toledo. This process uses a carburizing gas with ammonia and by regulating and controlling these gases a case containing a definite amount of carbide and nitrides is produced. Also featured by this company were radiant gas heating elements, high speed atmospheric muffle furnaces, products treated in atmosphere-controlled furnaces including eutectrol, gas carburizing, clean hardening and bright annealing. Several tables of automatic proportioning burner equipment as well as a gas-fired unit heater and a lighted furnace were in evidence.

A dense load draw furnace which is a distinct improvement over the original type and is much faster was exhibited by the Despatch Oven Co., Minneapolis. This unit can be operated equally as well at all temperatures from 250 to 1250 deg. F.

Outside of the industrial gas exhibit one found many other interesting booths showing gas-fired equipment and temperature controls, some of which are mentioned here.

Small tool steel hardening furnaces equipped with burners using gas at city main pressures, eliminating the necessity for blowers or compressors, were to be seen at the booth of Baker & Co., Inc., Newark. One of these was a muffle-type unit in which a prepared atmosphere was used. Temperatures of 1900-2000 deg. F. are possible with these furnaces which were heated to prove it. A gas-fired baking and drawing oven employed in the cleaning cycle system of the steel wire and rod industry constituted the exhibit of the Morrison Engineering Co., Inc., Cleveland.

A roller hearth continuous bright annealing furnace heated with gas radiant tube heaters incorporating the recuperative principle was featured by the Electric Furnace Company, Salem, Ohio. This new method of firing not only provides for complete combustion but also a high degree of preheat on more than 50% of the air required. This results in fuel economy comparable to that obtained in direct-fired furnaces. Single tubes extend through the furnace horizontally with a gas burner firing into one end with only half the air necessary for combustion. Through a smaller tube inside the first and extending from the opposite end toward the burner end the other 50% of air is provided. This is preheated by means of a heat exchanger.

The Mahr Mfg. Co., Minneapolis, showed a combustion control for forging furnaces that was first introduced to the public through the Columbia Tool Steel Co., Chicago. A line of new gas burners including proportional mixers, stack draft burners, etc. were shown by the Hauck Mfg. Co., Brooklyn. The standard "Cyclone" draw furnace of the forced convection type was the principal item of interest in the booth of the Lindberg Engineering Co., Chicago.

A newly developed high speed gas furnace in which the atmosphere is controlled within 0.25% and up to 11% CO was displayed by the National Gas Furnace Co. of Providence. One of the main features of this furnace is the radiant flame, the temperature of which is actually controlled to correspond with the furnace temperature. The atmosphere produced has an entirely different ratio of chemical components.

A number of manufacturers of temperature controllers were in evidence throughout the hall and most of them had newly developed equipment to show. Among these were: Minneapolis-Honeywell Regulator Co., The Foxboro Co., Illinois Testing Laboratories, Inc., Wheelco Instruments Co., E. J. Tagliabue Manufacturing Co., Automatic Temperature Control Co., Inc., and Leeds & Northrup Co.

Technical Papers Presented

Many technical papers of interest to the gas man were presented at the different sessions. Most of these were on heat treating and steel making and are too numerous to list here. However, of immediate interest to the gas industry were these papers: "Gaseous Media for Carburizing" by G. T. Williams, Cleveland Tractor Co., Cleveland; "Furnace Atmospheres and Decarburization" by J. A. Webber, Interstate Drop Forge Co., Milwaukee; "Commercial Gas Carburizing" by L. D. Gable and E. S. Rowland, Timken Roller Bearing Co., Canton, Ohio; "Light Cases by Gas Carburizing" by V. T. Malcolm, Chapman Valve Manufacturing Co., Indian Orchard, Mass. and "The Process of Dry Cyaniding" by R. J. Cowan and J. T. Bryce, Surface Combustion Corp., Toledo, Ohio.

Gas companies cooperating in the A. G. A. combined industrial gas exhibit were: Atlantic City Gas Co., Atlantic

(Continued on next page)

GOING AHEAD

WITH INDUSTRIAL GAS

With J. P. Leinroth as new president and Harry Sutton as secretary-treasurer of the New Jersey Gas Association, who says industrial men are not at last running a state association.

One heavy duty gas range company features the phrase "GAS is the ideal fuel" in its hotel and restaurant magazine ads. Nice work.

In making the new glass yarn, it passes through a gas flame to give it the fancy finishing touch. New uses of gas are getting quite flossy.

American Gas Furnace Co. carried 16 pages of special color advertising in a recent issue of "Industrial Heating." Sounds like some kind of a record.

Tons of Bread and Cake

GAS FUEL BAKES OVER 200,000 TONS OF BAKED GOODS EACH YEAR
WE BAKE THE DOUGH AND MAKE THE DOUGH
WHY? BECAUSE GAS HEAT ASSURES A BETTER, MORE UNIFORM PRODUCT; REDUCES UNIT COST; INCREASES OUTPUT —

Courtesy Consolidated Edison Co. of N. Y.

Tom Gallagher of Peoples Gas reports he is busy putting in gas ovens where electric ovens once graced the Chicago scene. A well known chain of restaurants and an equally famous chain of department stores are among the latest bakeries that Tom has captivated.

More open hearth furnaces are now on gas than at any previous time. At the Open Hearth Conference of the American Institute of Mining and Metallurgical Engineers everybody sat up and took notice. Some pretty good performances were reported.

It is claimed that the first place Natural Gas was used for industrial purposes was along the Kanawha River near Charleston, W. Va., about 1840. Tom Wood and his men in that territory say that the first hundred years are the hardest.

A 300' continuous gas kiln in Binghamton, N. Y., has replaced 12 old-type circular coal-fired kilns for making high grade face brick. Rejects are fewer, points out A. F. Wiegers, Industrial Manager of the gas company. But what tickles most is that the percentage of No. 1 brick is up and the overall cost is down. Who says this Biblical Art needs straws? All it needs is gas.

Gas Display at Hotel Show is Great Success

N. C. McGowen, center, president of the American Gas Association, photographed inspecting the gas exhibit at the National Hotel Exposition. With Mr. McGowen are, left, Daniel J. Brogan, commercial cooking representative, Consolidated Edison Co. of N. Y., and Alexander Forward, A. G. A. managing director. At the right is the entrance to the combined gas commercial cooking exhibit

THE National Hotel Exposition is one of the most important of the many national expositions in which the Industrial Gas Section of the American Gas Association, in cooperation with gas companies and equipment manufacturers, display up-to-date gas equipment each year," N. C. McGowen of Shreveport, La., president of the American Gas Association, declared after inspecting the exposition at New York's Grand Central Palace, November 15-19.

"We fully recognize the advantages of personally demonstrating gas apparatus to the many hotel owners, operators, stewards and chefs who attend from all over the country," he said. "I am particularly impressed with the improved efficiency, practicability and good appearance of the gas hotel and restaurant equipment shown, and believe such equipment fits in with the modern concept and layout of commercial kitchens."

Appromimately 60,000 registered at the New York show. This is an attendance, that for both quantity and quality, no gas cooking equipment manufacturer or gas utility men can well afford to overlook, for it is restricted to operators, owners, managers, and stewards of hotels and restaurants and is closed to the general public.

That the gas exhibit with its distinctive and attention compelling layout and color scheme, and located almost at the entrance to the hall, was the most striking and interesting in the exposition was the consensus of all who saw it. Cooperating with the Industrial Gas Section of the American Gas Association, in this exhibit was the Consolidated Edison Co. of New York, Inc., New York, and the following gas equipment manufacturers: American Stove Co., Cleveland; the G. S. Blodgett Co., Inc., Burlington, Vt.; Detroit-Michigan Stove Co., Detroit; Robertshaw Thermostat Co., Youngwood, Pa.; and the Standard Gas Equipment Corp., Baltimore.

This exhibit was built around the theme that up-to-date gas service can be rendered in hotel kitchens by the use of diversified appliances, both large and small, floor appliances as well as counter appliances. This was prompted by the fact that the trend is somewhat away from straight range cooking to cooking on specialized equipment and it is important that hotel men be informed that the trend is being fully met with gas. This show has attracted an increasingly large attendance by gas company representatives from the eastern and other sections of the United States for the past several years, as the growing importance of customer contacts actually made here has become apparent.

Most prominent features in the gas exhibit were heavy duty ranges; speed broilers of the ceramic type; bake ovens and deep fat fryers. Practically all of these were equipped wtih automatic temperature controls and safety pilots. Most of the equipment was connected to gas lines and lighted for full demonstration purposes. There were approximately 35 gas equipment company officials, engineers and experts in attendance to answer questions.

GAS EXHIBIT AT METAL SHOW

(Continued from page 441)

City, N. J.; The Brooklyn Union Gas Company, Brooklyn, N. Y.; Central Hudson Gas & Electric Corporation, Poughkeepsie, N. Y.; Consolidated Gas Electric Light & Power Co., Baltimore, Md.; Consumers Gas Co., Reading, Pa.; County Gas Co., Atlantic Highlands, N. J.; Cumberland County Gas Co., Millville, N. J.; Delaware Power & Light Co., Wilmington, Delaware; Elizabethtown Consolidated Gas Co., Elizabeth, N. J.; Hartford Gas Co., Hartford, Conn.; Jersey Central Power & Light Co., Asbury Park, N. J.; Metropolitan Edison Co., Easton, Pa.; New Britain Gas Light Co., New Britain, Conn.; New Haven Gas Light Co., New Haven, Conn.; New York & Richmond Gas Co., Stapleton, S. I., N. Y.; Pennsylvania Power & Light Co., Allentown, Pa.; Philadelphia Electric Co., Philadelphia, Pa.; Public Service Electric and Gas Co., Newark, N. J.; Scranton-Spring Brook Water Service Co., Scranton, Pa.; and Peoples Gas Co., Glassboro, New Jersey.

Technical Section

J. V. Postles, Chairman H. W. Hartman, Secretary F. M. Goodwin, Vice-Chairman

The Preparation and Requirements of Study Material for Gas Service Training*

By SCOTT A. SALISBURY

Pacific Gas and Electric Company

AN experienced gas serviceman, if given an entirely new type of gas equipment, can determine its use and method of operation by taking it apart and using his ability to observe and reason. However, a great amount of time and mental energy can be saved and the same result can be accomplished even with men of limited experience if they are given a sketch or diagram and an outline of the theory of operation of each article to be studied. This material may be clipped into a book and carried by each man in a metal cover in his truck as an aid to his memory when the same mechanical device is found in actual service.

With two purposes in mind, ease in learning and for use as a reference, three types of technical literature have been used:

1. Textbooks covering the elementary principles of the use of gas and the operation of widely used standard gas appliances, supplemented by looseleaf rotoprints describing new appliances as they appear.
2. Manufacturers' pamphlets and catalogs.
3. Hectographed and mimeographed sheets of diagrams, questions to aid in study and examination questions.

In a large company the first type of data is usually supplied by the general office. The third type can however be produced locally. This discussion is primarily to consider these locally produced sheets. For instance, a new type of valve comes into use. In order to make a sketch of the valve it is taken apart by the instructor and from the appearance of the actual valve and the pictures in the manufacturer's bulletin a sketch is made to show the interior in such a way that it is easily understandable to servicemen not accustomed to reading blueprints. This sketch is not made to scale nor is it a technically correct mechanical drawing as it is only to serve as a guide for gas service instruction with the least possible drawing. The original is made in purple hectograph ink and enough copies run off for all local class members.

Next the instructor inspects each part of the valve and writes a list of questions to assist the class members in their study before class. In doing this the instructor has to ask himself constantly, "What is this part? Why is it here? What does it do?" Then he frames a question to bring out each answer. Several false answers accompany each correct one and blanks are provided for the student to check the one he believes to be correct.

The sketch and the questions are issued several weeks before the date of the class meeting at which they are to be discussed. The valve is made available to the men and they answer the questions at odd times or at home. Many interesting arguments develop between different service men and controversial points are brought before the instructor for answer. By the time the questions are answered, the men have learned a good deal about the physical construction of the valve and the theory of its operation.

All that remains is to gain experience with actual operation and find out what troubles may possibly be encountered in service work in the field. The class meetings help bring the whole group up to the standard of the best men who learn by themselves on their own time. In order to excite interest and challenge the men's ability a quiz is given. The questions are designed to be as practical as possible and to approach the subject from the viewpoint of the man in the field and as nearly as possible in his own language.

With this general procedure in mind let us go into detail with actual examples of the three classes of locally prepared sheets. The diaphragm gas valve in Figure I is a typical example of a sketch of a piece of equipment. This is simple, plain and easy to understand, yet it shows all that is necessary to clarify the theory of operation as given briefly below the sketch. Notations point out the important parts and numerous arrows are used to show the flow of gas.

The questions to aid in study before classes are of three types—

First, to bring out theory of operation,
Second, mechanics of operation, and
Third, physical details of construction.

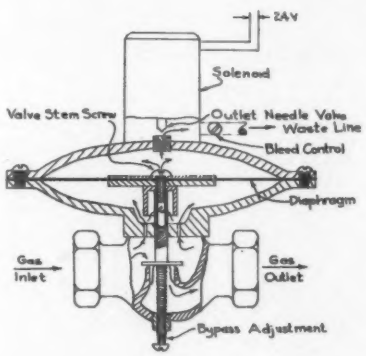


Fig. 1. The ——— Diaphragm Gas Valve is a Solenoid controlled diaphragm gas valve. When the Solenoid is energized the outlet needle valve is opened allowing gas to bleed out the waste line. As the gas bleeds out faster than it can come in, the pressure on top of the diaphragm is reduced, allowing the line pressure on the under side of the diaphragm to lift it, opening the valve. When the current to the Solenoid is shut off, the outlet needle valve closes. This allows gas to come in through the openings in the bottom diaphragm chamber, through the hollow valve stem and drilled valve stem screw to the top diaphragm chamber.

When the pressure on the top builds up to a pressure equal to that on the bottom of the diaphragm the valve closes of its own weight.

The time of opening may be regulated by the bleed control screw. Screwing in on the screw makes the valve slower opening.

Example I—Theory of Operation

Question: If the escapement line from a gas actuated diaphragm gas valve should become plugged, the effect would be:

(a) to open the valve.
x (b) to close the valve.
(c) to hold the valve closed, but not to close it.

The gas serviceman who is attempting to answer this question will probably first try to locate the "escapement line" on the sketch of this type of valve. Or he may go to the cut-away or complete demonstration setup and figure out for himself which piece of pipe or tubing is the escapement line. Next he may think, "If I plug this line, what does it do to this main valve?" The average workman can think it out much more easily if he can get his hands on the escapement line and valve in a cut-away model or working setup where he can actually plug the escapement line and see what happens. By the time he has found the answer to the question, he has become familiar with the valve and has learned

* Report of P. C. G. A. Subcommittee on Employee Training for Utilization Work, presented at annual convention of Pacific Coast Gas Association, Seattle, Wash., August 17-19, 1937.

much more about the operation of that particular valve than is asked for in the question.

Example II—Mechanics of Operation

Question: A permanent magnet is used in an electric thermostat to:

(a) prevent arcing across the contact points to make them last longer,
(b) hold the thermostat in the "On" position longer,
x (c) to prevent arcing at the contact points which results in jumping of the solenoid.

This question led to many arguments among the men, during which such details of operation as the adjustment of the thermostat differential by shifting the position of the magnet, the functions of the blade and bimetal element of the thermostat, and the opening and closing forces of the two-wire solenoid valve were brought to their attention in such a manner as to stay. They also were led to look forward to the next regular class meeting and a settlement of the argument.

Example III—Physical Details of Construction

Question: The thing that opens or closes a "————" direct acting thermostat is:

(a) A Sylphon bellows with bulb and tubing,
(b) Bimetal snap disc,
(c) Sylphon bellows only.

This is a question that causes the man answering it to associate the name of the article with its appearance and to identify the proper part by looking at a drawing, or preferably at the direct acting thermostat itself. He also gets an idea of the manner of operation.

Examinations

The quiz or examination questions given in class may be put into the same classifications as the above. However they are made more practical to simulate actual problems that may arise in service work and at the same time to call for a short brief answer.

Example I—Theory of Operation

Question: How can pressure on the top of diaphragm of a "P————" diaphragm gas valve close the valve if opposed by an equal gas pressure on the lower side of diaphragm in addition to a spring?

Answer: The pressure per square inch is the same on both sides of the diaphragm but the top has a greater area and therefore exerts a greater force.

It can be shown in class by the use of a demonstration setup that when the line pressure is put on both sides of the diaphragm the valve closes and the main burner goes out. Then the attitude of the instructor to the practical man is that "The valve actually works the way the question says it does!" I do not know why it works, but you work on these in the field so you ought to be able to tell me."

Example II—Mechanics of Operation

Question: If you leave the cap off of the "P————" Controller after adjusting the steam pressure setting, the main gas valve will:

x (a) open and stay open,
(b) close and stay closed
(c) stay in whatever position it is already in.

(a) and (c) are correct answers if in (c) a note is added "if the main gas valve is already open."

This is a practical question in operation, for if the manner of operation is not understood and the cap is dropped and lost, the gas will be bled off of the top of the main diaphragm valve and it will remain open with no possibility of being automatically shut off by the low-water, steam-pressure or temperature controls. If the main valve is already open no gas leak will be noticed at the place where the cap is taken off, and to one who does not understand, this would not seem a serious matter.

Example III—Physical Details of Construction

Question: How do you check the heater elements of "M————" heat accelerating or heat anticipating thermostats for proper selection?

Answer: Note the type and number of the electric valve, the type and number of the thermostat and the color of the screw-head of the heater elements and refer to tables as issued by the manufacturer.

This is practical in that the thermostats referred to will not give their best temperature control unless heater elements designed to match the resistance of the rest of the electrical circuit are employed.

The answers to all quiz questions are discussed in class immediately after the quiz so that all will benefit from the correct answers while they are still curious.

The primary purpose of the class quiz is to help the men to learn and that is kept in mind by the instructors at all times. The points not clear in the minds of the class members are brought out and the correct answers stressed. A secondary purpose is for grading, although it is recognized that many good servicemen lack ability to write down what they know, and that writing is often easier for others than actually doing what they write about.

In conclusion, several advantages for this way of handling class material may be listed:

(a) permanent texts are not filled with material of passing value or local interest,
(b) much detail at the time of study makes learning easier,
(c) debatable questions can be settled before being incorporated in permanent sheets,
(d) temporary sheets can be used by the general office as a basis for permanent roto-sheets,
(e) sheets on appliances of interest to only one locality need not be printed in better form, eliminating the expense of printing in small lots.

Finally, it may be stated that study material similar to that analyzed above definitely aids gas service instruction in its ultimate purpose of perfecting service and maintaining the confidence of the consumer in service men and the gas industry which they represent.

Gums in Gas

The Gas Journal (London) commenced in its October 13, 1937 issue, pages 167-168, translations summarizing reports and papers presented to the 60th Congress of the Union Syndicale de l'Industrie Technique du Gaz en France, held June 9-12, 1937. The following is taken from that source.

J. ARNAUDEAU described an investigation carried out at Gennevilliers as a result of the occurrence of gum deposits in a high-speed Rateau booster having a capacity of 1¾ million cu. ft. of gas per hour. The gradual accumulation of the deposit lowered the capacity of the machine to 75 per cent of the initial value after 25 days of operation. The gum being soluble in cresylic acid, it was decided to make use of cresylic acid for the periodical cleaning out of the booster and a system for forced circulation of cresylic acid into the working parts of the machine was installed. It embodies a 45-gallon storage tank and three injectors, giving a total throughput of cresylic acid at the rate of 5 gallons per minute. Due to the corrosive action of cresylic acid on copper, all the bronze parts of the circulating pump were replaced with similar parts of cast iron or steel.

To avoid losses of solvent, cleaning is effected when the booster has been shut down. The gas inlet and outlet valves are closed and the booster and the circulating pump are started up. When the booster has reached full speed, its motor is shut off and the booster commences to slow down. When the speed has dropped to 3,500 revolutions per minute, the cresylic acid supply valve is opened and is allowed to remain open until the booster stops. This requires about 3 minutes, and during this time about 15 gallons of cresylic acid have been circulated. The cresylic acid removes the gum deposit both by solution and by mechanical means, and after the operation the capacity of the booster is restored to its full value. Experience showed that cleaning should be carried out after every 120 hours of operation. The cresylic acid is replaced after it has been used 12 times.

* "Industrial and Engineering Chemistry," Analytical Edition, 15/i/36, p. 15.
† Zeitschr. f. Angew. Chem., 1929, 42, 911.

A complete examination was made of gum deposits collected from various parts of the machine and definite proof of the vapour-phase origin of the gum was obtained. Attempts were made to regenerate gum-forming hydrocarbons from the gum by thermal cracking, and condensates containing indene, styrene, and coumaron in small quantities were obtained. When vapour generated from the gum was passed over heated copper turnings and then into Afasaniev's reagent,* evidence of the formation of cyclopentadiene was obtained.

Successful attempts were also made to determine, in coal gas, the unsaturated hydrocarbons responsible for vapour-phase gum formation. Twenty cubic feet of the dried gas were passed at the rate of 1½-2 cu.ft./hr. into two absorption tubes immersed in a freezing mixture of acetone and solid carbon dioxide and each containing 20 cc. of petroleum ether. The petroleum ether solution was then added to a chilled petroleum ether solution of a known weight of maleic anhydride, the mixture allowed to warm to room temperature and finally digested at 45-50 degrees C. under a reflux condenser. The solvent was then evaporated in vacuo and the addition product of maleic anhydride plus gum-forming hydrocarbon was weighed. The reaction on which the method is based is that of Diels and Alder.† Evidence of the presence of 25-60 grains of gum-forming hydrocarbons per 100 cu.ft. of debenzolized gas was obtained.

A method for the determination of nitric oxide in gas was developed. The nitric oxide is oxidized to nitrogen peroxide by means of aqueous potassium permanganate. The peroxide is absorbed in an acetic acid solution of metaphenylene diamine and the Bismarck Brown is estimated colorimetrically with use of a standard sodium nitrite solution also treated with the diamine reagent. Since the oxidation of the nitric oxide is incomplete a calibration curve must be established. Tests on the gas produced from various types of plant showed nitric oxide contents in parts per million as follows:

	Maximum	*Minimum*	*Mean*
Woodall-Duckham continuous vertical retorts	0.9	0.5	0.65
Inclined chambers	12.0	1.1	4.2
Carburetted water-gas plant	1.9	1.9	1.9

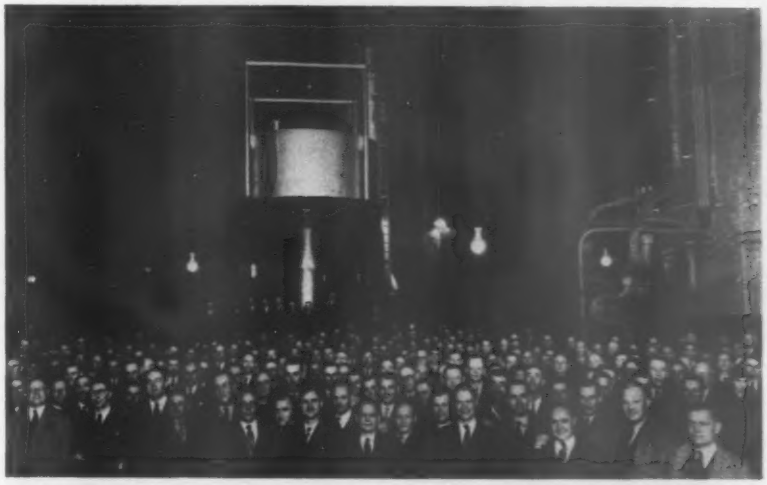
The low content of nitric oxide in the continuous vertical retort gas was due to the close pressure control effected by means of governors and to the consequent prevention of passage of waste gas into the retorts. The constancy of the nitric oxide content of the carburetted water gas is in conformity with the inherent nature of the process of manufacture since at each cycle a certain quantity of nitric oxide present in the blow gas is introduced into the water gas as a result of purging.

The nitric oxide content of coal gas decreases progressively during the various stages of physical and chemical purification and may reach as low a figure as 0.25 part per million after the oxide purifiers. Backward rotation with revivification in situ appears to be less efficacious than are the older operating methods involving external revivification. Whereas backward rotation may reduce the nitric oxide concentration to 0.5 part per million, the older method may yield a figure as low as 0.15 part. This is due to the fixation of nitric oxide by the iron sulphide present in fouled oxide.

In a study on the synthetic formation of vapour-phase gum from gas charged with nitric oxide, cyclopentadiene and oxygen, the findings of other authors were confirmed—namely, that an induction period is involved and that the presence of water vapour accelerates deposition of the gum. In the induction period, peroxides are formed from the hydrocarbons and these finally catalyze gum formation.

—A. G. K.

By-Products Recovery Studied in Miniature Gas Works



More than 400 Portland Gas & Coke Company veterans inspect a miniature gas plant which will be used for experimental work in expanding a better than $1,000,000 yearly by-product business. The little plant's generator may be seen in the extreme background, nearly obscured by the gas holder. At the right is a portion of one of the large generators with an hourly capacity of 200,000 cubic feet

EXHAUSTIVE study in the field of chemical by-products recovery is foreseen in an announcement that Portland (Ore.) Gas & Coke Company has completed an experimental or "pilot" plant which will be devoted entirely to research.

First of its kind in the Northwest, the new apparatus will facilitate experiments in which low-grade petroleum is broken down into its component parts and the molecules re-grouped to form different chemical compounds of greater value than the original material.

A complete gas works in miniature, the plant will also be used for experiments designed to increase the yield of present by-products, according to E. L. Hall, operating manager, who designed the installation.

"The pilot plant clears the way for many different types of experiments which cannot be carried on satisfactorily with small laboratory equipment or with the company's big gas units," said Mr. Hall. "It will now be possible to test various raw materials in relatively small amounts under conditions closely approximating those found in large scale production."

Completion of the "pilot" plant was announced as the highlight of a meeting of the Gasco Veterans' club, which also celebrated the 25th anniversary of the construction of the company's $5,000,000 works near the city's edge. More than 400 employees who have been with the company ten years or more were present.

Mr. Hall said that Portland gas rates had been brought to the present low level mainly as a result of the company's early entry into the by-product field.

Markets to which gas company by-products are being shipped regularly include California, Puget Sound, British Columbia and the Atlantic seaboard, with occasional shipments to Europe and the Orient.

Included in the present list of by-products are benzol, tar, chemical sulphur, briquets, naphthalene, toluol and carbon black. Sales already are grossing over $1,000,000 annually.

Testing Laboratories

R. M. Conner, Director — Managing Committee: J. S. DeHart, Jr., Chairman — N. T. Sellman, Secretary

New Standards to Become Effective January 1

Hotel and restaurant ranges used in performance research

REVISED requirements for Domestic Gas Ranges, Hotel and Restaurant Ranges, Draft Hoods, Water Heaters and Semi-Rigid Tubing were approved as American Standard by the American Standards Association on October 22. These standards are to become effective on January 1, 1938.

New requirements for domestic gas ranges eliminate the need for definite rating of ovens in ranges for use with city gases. If the oven meets satisfactory performance requirements any reasonable rating is acceptable. This procedure has been permitted on ranges for use with propane gas for about a year.

A new requirement governing oven preheating inputs and maintaining rates is also included in the revised standards. Top section thermal efficiency requirements for all domestic ranges have been increased. Revisions place limitations on pilot lighter consumption to increase still further economy of operation. To eliminate the possibility of corrosive action of insulating material on aluminum tubing, the use of such tubing is restricted where it is in contact with insulating material of other than neutral reaction.

The outstanding change in hotel and restaurant range requirements is the addition of requirements for such ranges for use with propane gas and butane-air gas. New requirements were established for top burner and top section thermal efficiency for open top, fry top and solid top ranges.

Performance requirements for draft hoods have been entirely revised. Previous requirements were based upon the pressure drop through the hood when preheated air was passed through it at a definite temperature and velocity. The new standards provide two sets of performance requirements, one set governing draft hoods for use with converted central heating equipment and a second set for draft hoods used with gas water heaters and with gas converted water heating equipment. A listed gas conversion burner installed in a standard steam boiler designed for solid fuel is used for testing draft hoods for use with converted central heating equipment. A standard manual type circulating tank water heater is used for testing draft hoods for use with gas water heaters and gas converted water heating equipment. This change enables manufacturers to duplicate requirements tests in their own factories, whereas the special equipment heretofore required made testing in their own plants impracticable.

Revised water heater standards affect largely automatic heaters. All water heaters for use with gases having a specific gravity greater than 1.0 must be equipped with a device which automatically shuts off the gas supply to all main burners and pilots in case the means of ignition becomes ineffective. All heaters must carry detailed instructions for lighting to insure safe lighting of pilots and main burners. An added requirement for low recovery units calls for satisfactory combustion with draft hoods removed. This requirement was adopted for the reason that very low input heaters are not always flue connected and it was felt that provision should be made for proper combustion in case a plate or other object should inadvertently be placed on the flue outlet.

Endurance tests on semi-rigid tubing have been revised to give more specific test procedures and to provide tests more consistent with the conditions under which such tubing is used. Specifications for tubing dimensions now permit manufacturing tolerances in tubing wall thickness.

Printed copies of the American Standards referred to previously are obtainable from the American Gas Association Testing Laboratories, 1032 East 62nd Street, Cleveland, Ohio.

Determination of Porosity of Oil Sands

INFORMATION regarding the pores or voids in reservoir rocks is vitally important in the scientific extraction of petroleum from natural underground reservoirs, states the Bureau of Mines, United States Department of the Interior, in a report recently issued describing the bureau's method of determining porosity of sandstones and other porous rock cores taken from oil and gas wells. The report also gives in tabular form the results of several hundred porosity determinations for oil sands in fields of 11 States.

The method of determining the effective porosity of oil sands, as developed at the Petroleum Experiment Station of the Bureau of Mines, Bartlesville, Okla., falls within the general classification of gas-expansion methods and was developed as a part of the engineering research dealing with fluid and energy relations in natural reservoirs and improved oil-recovery methods. The apparatus and procedure are well adapted to the requirements of the bureau, and oil and gas operators generally should find the information useful in gaining further knowledge of fluid behavior in porous reservoir rocks.

The Bureau of Mines method differs in various respects from others of the gas-expansion type. Pressures from 40 to more than 200 pounds per square inch are used rather than atmospheric pressure; also the gas is expanded to atmospheric pressure and the volume measured rather than expanded to a definite volume and the pressure measured.

Copies of R. I. 3352, A Method of Determining Porosity: A List of Porosities of Oil Sands, by D. B. Taliaferro, Jr., T. W. Johnson, and E. J. Dewees, may be obtained upon request, without charge, from the Information Division, Bureau of Mines, Washington, D. C.

EXECUTIVE RESPONSIBILITY FOR ACCIDENT PREVENTION

(Continued from page 416)

tures, and that executive cooperation, without which any plan must fail, be supplied.

This has been our company policy for many years and there is nothing in the field of approved safety equipment of which we have knowledge which may not be obtained if necessary for use by our employees.

This attitude is expressed by every executive in our system companies. It is the fundamental basis upon which industrial progress must be built—the consolidation of those forces which together make of accident prevention a pleasurable task and a mutually profitable pursuit. Without that cooperation accident prevention, regardless of the money spent or saved, will fail of its purpose.

GAS APPLIANCE NEEDS OF THE INDUSTRY

(Continued from page 414)

Obviously, it is difficult to make progress when such a wide difference of opinion exists. It is not the purpose of this discussion to examine these contradictory claims and establish their fault or responsibility. We believe the facts are self-evident.

It is apparent that we lack the equipment necessary to do a good competitive job. It is just as apparent that many utilities have inadequate rate structures and inadequate sales promotion policies.

Conclusion

This difference of opinion as related to the appliance needs of the industry is the important finding of our research into the problem, and it is this particular phase that must be solved if progress is to be made.

The more rapid development of new and improved equipment is, primarily, a problem of research and therefore is dependent upon the amount of research and development work which the manufacturers and the utilities can do. It appears that the manufacturers have facilities for research, ample talent, and the willingness and understanding to develop new and improved equipment.

Hence, the definite conclusion on the development of better equipment points to the establishment of a representative agency or committee to determine the major appliance needs and simultaneously secure the concurrence of the industry as a whole that such equipment will be purchased when produced.

These steps in this procedure should include: (1) The feasibility of the proposed equipment; (2) Its market opportunity; and (3) A merchandising plan to promote this equipment and stimulate sales so that the utilities and the manufacturers will receive ultimate profit.

Such a committee exists today on the development of the new certified performance range. The leadership is excellent, its members are earnest in their endeavor, and they are doing a wonderful job. The objectives of the committee are sound, excellent progress

Statement of the Ownership, Management, Circulation, Etc., Required By the Acts of Congress of August 24, 1912, and March 3, 1933

Of American Gas Association Monthly published monthly except July-Aug. which is combined at Brattleboro, Vt., for October 1, 1937.

State of New York, County of New York, ss.

Before me, a Notary Public in and for the State and county aforesaid, personally appeared James M. Beall, who, having been duly sworn according to law, deposes and says that he is the Editor of the American Gas Association Monthly and that the following is, to the best of his knowledge and belief, a true state ent of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, American Gas Association, Inc., 420 Lexington Ave., New York, N. Y.; Editor, James M. Beall, 420 Lexington Ave., New York, N. Y.; Managing Editor, None; Business Managers, None.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.)

American Gas Association, Inc., 420 Lexington Ave., New York, N. Y.; President, Herman Russell; Vice-Presidents, N. C. McGowen, Conrad N. Lauer; Treasurer, J. F. Rooney; Managing Director, Alexander Forward (all of 420 Lexington Ave., New York, N. Y.).

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the twelve months preceding the date shown above is . (This information is required from daily publications only.)

JAMES M. BEALL, Editor.

Sworn to and subscribed before me this 15th day of September, 1937.

(Seal)

LAWRENCE P. BROWN,
Notary Public, Queens Co. No. 193, Reg. No. 4475
Cert. filed in N. Y. Co. No. 191, Reg. No. 9-B-214
Commission expires March 30, 1939

has been made, and they are doing the very job of coordinating the needs of the utility with the ability of the manufacturers to perform, definitely and completely. This committee also realizes the necessity for proper merchandising and are paving the way to publicize this equipment by setting up a sound sales promotion program.

Before I summarize the other phase of this problem, which is merchandising, I believe a few words regarding the price of equipment are appropriate, because of the apparent need of the industry for equipment to meet the economic limitations of the low income bracket customers, particularly where strong competition from oil exists.

Fundamentally, the only intelligent approach to the problem of cost must come from an appreciation that the greatest element that reduces cost is mass production, and mass production can become a reality only if a uniform product is accepted.

Therefore, the development of equipment for low income brackets can be accomplished only when representatives of the utilities needing such equipment agree on a standardized piece of equipment which represents the best that money can buy, and then follow it up by establishing merchandising setups which include lower mark-ups, longer term payments and other merchandising aids to make possible the sale of this equipment to the low income bracket customers.

The merchandising activities of the utilities are varied in their intensity, some have excellent merchandising programs, with sound sales procedure of great intensity, while others have practically no merchandising at all. From a national standpoint, it must be disappointing to many manufacturers of equipment that territories rich in potentialities remain unstimulated because of the lack of interest on the part of the utilities. This inactivity obviously affects the opportunity for appliance sales by the manufacturers and vitiates the position of the industry by allowing territories to remain stagnant in the face of competitive success.

In many utilities the merchandising activity is projected largely on past precedent and past activity, both as to expenditure and intensity of sales stimulation. Such basis may have been justified in the past when no definite competition existed. Today, if competition is to be met and the gas industry as a whole is to improve its position, these utilities must gear their sales activity to the present needs which are much more severe. Such activity means the establishment of sound marketing policies, intelligent appraisal of the opportunities that exist, ample personnel to cover this market, properly educated sales personnel to sell the values of gas, and a plan of procedure that contemplates proper interpretation of the needs and wants of every class of customer.

Personnel Service

SERVICES OFFERED

Sales Engineering. Long experience merchandising gas appliances both for utilities and manufacturers. Surveys, sales, specifications and servicing for househeating, water heating, hotel and restaurant and industrial gas applications; utility or manufacturer. **1152.**

Can I Help You in **promotion** of **appliance sales,** load building and public relations? College man, six years' gas utility public contact experience. Meter reader to credit manager, including high bill adjustment. Now employed New York office large industrial. Record proves successful promotional experience. Trained in advertising, merchandising. Qualifications distinctive. **1155.**

A Good Salesman—over ten years with national manufacturers distributing gas appliances, air conditioning and pipe fitting specialties. Knows gas officials throughout East and Midwest. Can promote sales by proven methods. Understands advertising helps and is prepared for sales directing work. Wants a good opportunity. **1156.**

Appliance Salesman—Twenty years' experience selling gas appliances in all eastern and southern territories. Interested in the exclusive sale of nationally known, or equal products to act as a manufacturer's agent. Have personal contacts with all wholesale and retail dealers and utility companies. Will organize selling force with proper lines. **1159.**

Understands selection also methods for improving employee performance and morale; ten years' experience in one of largest combination gas and electric companies, also three years in government **personnel work** covering three states; familiar with employee training needs and understands how to correct and meet public demand for high quality service. College background. **1160.**

SERVICES OFFERED

Gas Engineer with wide experience, manufacture, house heating, air conditioning, and general appliance sales, also sales promotion experience with large manufacturer. Open for position with gas company's house heating department or as manufacturer's representative; original and practical ideas on range design. Married. **1161.**

Sales Engineer, gas heating, air conditioning merchandising experience, familiar with retail selling and promotion work through dealers. At present in supervisory capacity in gas heating department with large heating company. Previously five years selling experience with a large New York metropolitan company. Broad experience, electric and steam power companies. **1162.**

Distribution or works superintendent; one who knows how to take the most out of coal carbonized, experienced with horizontal also vertical retorts, wet and dry purification, benzol recovery, the manufacture of sulphate of ammonia; also knows high and low pressure distribution. **1163.**

Executive Engineer. Unusual educational background. At present employed. Wide experience and acquaintance in the natural and manufactured gas, electrical and water industries desires change. He had construction, operating, sales, legal, purchasing, accounting and research experience. Widely travelled. Will locate anywhere. Has had success rehabilitating properties producing operating and financial results. **1164.**

Gas Engineer with 20 years' experience in the design, construction, operation, and valuation of both manufactured and natural gas properties, desires position where initiative and the ability to handle any problems are necessary. **1165.**

SERVICES OFFERED

Cost accountant—experienced on fixed capital inventory work—familiar with analyzing of records, new unit system set up, cost work and card systems. **1166.**

Gas Engineer—Househeating and industrial gas sales. Broad experience in gas industry. Expert on winter air conditioning in all phases of work. Outstanding record as a producer of permanent users on all types of gas appliances. Good health, persistent hard worker. Desires connection with utility or manufacturer who can utilize my services on a reasonable basis. At present employed, but desire broader opportunity and better income. Graduate; married (39). **1167.**

Recent graduate in gas engineering. Laboratory experience in **domestic** gas utilization and chemical control. **Industrial** experience as fuel **engineer** in large steel plant. **1168.**

Gas Engineer—1937 graduate. 4 months experience in by-product recovery work with large coke plant. Desires position with manufactured water gas plant either in operation or in research. **1169.**

POSITIONS OPEN

Applications are invited for two vacancies in a growing organization (1) **Manager** with experience and successful record handling small gas property. (2) young **Gas Engineer,** under thirty-five, graduate of engineering school, familiar with gas manufacture, particularly water gas, and gas measurement; knowledge of reforming gases beneficial. **0330.**

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